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ABSTRACT

Based primarily on the experience of three childhood injury prevention demonstration projects, this manual provides state Title V program directors with an action guide for developing targeted childhood injury prevention programs. The manual is divided into four sections: background; program planning; program design; and program implementation and evaluation. Containing "how-to" information, specific examples, and helpful hints, the manual can be used to develop a total program, to implement separate program components, or to improve or expand existing programs. Chapter I discusses unintentional injury among children in terms of mortality, morbidity, and risk factors influencing injury type and distribution. Chapter II supplies concepts useful in identifying injury factors, conceptual tools for generating countermeasures to unintentional injury, and concepts and issues associated with assessment of countermeasures. Program planning is discussed in Chapters III and IV which focus, respectively, on assessing statewide need by collecting and analyzing epidemiological data and on initial phases of program planning. Formulating strategy, surveying prevention approaches, and designing prevention materials, all aspects of program design, are discussed in Chapters V, VI, and VII. Chapter VIII focuses on program organization and administration; Chapter IX discusses selection and cooperation with local communities; and Chapter X overviews evaluation design and data analysis. (RH)

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DEVELOPING CHILDHOOD INJURY PREVENTION PROGRAMS:

An Administrative Guide for State Maternal and Child Health (Title V) Programs

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Health Resources and Services Administration
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Division of Maternal and Child Health

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EXECUTIVE SUMMARY

State Title V agencies are a natural locus of injury prevention activities for children. In its leadership capacity, State Title V agencies are responsible for needs assessment, resource development, standard setting, quality assurance, advocacy, and professional consultation related to health care of mothers and children. Because accidental injury is a major cause of childhood morbidity and mortality, it is logical that State Title V agencies encompass the development of programs and services to reduce preventable injuries in their leadership missions.

This Manual provides State Title V Program Directors with an action guide for developing targeted childhood injury prevention programs. Although it draws from many sources, it is based primarily on the experience of three childhood injury prevention demonstration projects. Funded in 1979 by the DHHS Division for Maternal and Child Health* and co-sponsored by the DHHS Division of Emergency Medical Service*, the projects were conducted under the auspices of State health departments in California, Virginia, and Massachusetts. Over the three year grant period, each project:

- Conducted an epidemiological study
- Developed a strategy and specific interventions targeted to the age groups at risk for especially problematic injuries
- Implemented the strategy and interventions in one or more target communities
- Evaluated project results

This Manual is organized to reflect this approach. It contains much "how-to" information, specific examples, and helpful hints. The manual can be used to develop a total program, to implement separate program components, or to improve or expand existing programs. It is divided into four sections: background; planning the program; designing the program; and implementing and evaluating the program.

BACKGROUND

1. UNINTENTIONAL INJURY AMONG CHILDREN

With the decline of morbidity and mortality from communicable disease, unintentional injury has emerged as the major childhood threat. Unintentional injury is the number one killer of children age one to 14. It accounts for about 42 percent

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* Located in the Bureau of Health Care Delivery and Assistance, Health Resources and Services Administration, Public Health Service.

of deaths among one to four year olds and nearly 51 percent of deaths among five to 14 year olds. Motor vehicle injuries, burns, and drowning rank as leading causes of accidental death.

Morbidity data further illustrate the magnitude of the unintentional injury problem. The 1981 National Health Interview Survey reveals that children under 16 experienced 23 million injury incidents. The likelihood of sustaining a particular injury varies with age:

- Children under six are at high risk for falls, poisonings, and burns.
- Children between six and 12 are at high risk for falls, sports injuries, and motor vehicle injuries.
- Children between 13 and 19 are at high risk for sport injuries, motor vehicle injuries, and falls.

Other factors influence injury type and distribution. Demographic and socioeconomic characteristics of children and their families and the geographic and topographic characteristics of their community affect injury propensity.

2. CONCEPTS EMPLOYED IN INJURY PREVENTION

Injuries are not accidental. Instead, they arise somewhat predictably from certain interactions between: people; the machines, vehicles, and substances they use; and the environments in which they live, work, and play. The injury prevention field rests on the belief that understanding how these factors interact leads to developing effective countermeasures for injury prevention. Factors can be categorized by applying the classic epidemiological triad of host-agent-environment to injury situations. Factor interactions can be described in three phases.

In the pre-event phase, factors combine to create injury **potential**. In the event phase, some factors reduce while others increase injury **severity**. In the post-event phase, certain factors influence injury **outcome**. Haddon's injury control matrix is useful for analyzing injury events prior to developing countermeasures to prevent their occurrence.

Countermeasures then can be developed by asking: (1) how can the host's vulnerability be reduced; (2) how can the agent's injurious potential be reduced; and (3) how can contact between host and agent be prevented? The two major types of countermeasures are active and passive:

- **Active countermeasures** require individual initiative and effort to ensure effectiveness. Active countermeasures can be simple, relying entirely on human action (like placing medicine out of reach). Or they can be complex, depending on a combination of human action and protective devices (like using childproof medicine containers).

- **Passive (Automatic) countermeasures** do not require individual initiative or activity to ensure effectiveness; instead **engineering** provides protection by incorporating automatic safety features in furniture, toys, appliances, or vehicles or by removing environmental hazards—dangerous play equipment, concrete play surfaces, bushes obstructing vision, poorly located signs, and so forth.

When people fail to use demonstrably effective, active countermeasures to prevent serious and frequent injury, then society eventually may override arguments of "personal choice and personal freedom" to mandate safe behavior or the use of protective devices.

Countermeasures can be assessed using three criteria: effectiveness, impact, and cost. Effectiveness depends on the likelihood that a countermeasure will be used and used correctly. Likelihood of use depends, in turn, on necessary frequency of action and level of effort required. Passive measures have the best chance for effectiveness since they do not rely on individual action. Active countermeasures vary widely in their effectiveness depending on: (1) how often the action is required; (2) how much effort is required; (3) what deterrents limit use; and (4) what incentives promote use.

Countermeasure impact and cost should be projected before committing resources to any one approach. Impact can be difficult to estimate; review the literature for suggestions. Project both the cost of implementing countermeasures and the cost associated with unchecked continuation of the injury trend in question.

PLANNING THE PROGRAM

3. ASSESSING STATE NEED BY COLLECTING AND ANALYZING EPIDEMIOLOGICAL DATA

Conducting an epidemiological study is the most productive first step in developing a childhood injury prevention program, because the resulting data provide decision makers with the tools for building all subsequent program activities. Epidemiological study objectives are to determine:

- **Problematic injuries** by revealing which injuries occur most frequently and their relative severity. This information provides a basis for selecting **target injuries.**

- **Populations-at-risk** by revealing which population subgroups within the State disproportionately experience target injuries. This information provides a basis for selecting **target populations.**

- **Injury causes** by revealing what combination of circumstances consistently contributes to target injuries in target populations. This information provides a basis for selecting the **prevention strategy** and **intervention designs.**

Epidemiological data can be collected in three ways: (1) using existing data bases: (2) developing new data bases; and (3) combining existing data and new data. Carefully weigh the relative advantages of each option in terms of data adequacy, collection cost, staffing needs, and time requirements. **Existing data bases** can provide much useful information; examining such data bases should be the first program activity. Using existing data is less expensive than collecting new data, though not all required data may be available. Moreover, available data may not be of the desired quality or in usable formats. **Developing new data bases** allows the program to obtain all desired information of the quality and in the format needed. On the other hand, collecting new data is extremely expensive, complicated, and time-consuming. **Combining existing and new data** permits the program to target injuries or at risk population groups first and collect new data on a smaller scale later.

(1) Epidemiological Data Definitions

Epidemiological data are collected on individual cases and then combined to reveal problem injuries and injury causes within specific population subgroups. They describe:

- **Who** was injured—demographic and socioeconomic characteristics of injured children and their families
- **What** was the result and nature of the injury—level of medical treatment required or death and injury description (preferably using the International Classification of Disease (ICD-9-CM) injury codes (N-codes)).
- **When** the injury occurred—date and time
- **Where** the injury occurred—location
- **How** the injury happened—external cause of the injury (preferably using a supplementary set of ICD codes called E-codes).
- **Why** the injury happened—contributing environmental circumstances

(2) Data Sources And Existing Data Bases

Epidemiological data can be collected from individuals and health care organizations with which injured children come in contact. These data sources can be categorized using the same variables that describe injury result: treated at **home**, treated by a **physician**, treated and released in the **emergency department**, admitted to the **hospital**, and **died**. The distribution of injured children can be visualized as a pyramid. The largest number of injured children are treated at home or by a physician; the smallest number

of injured children are admitted to the hospital or die. Data are most available for the pyramid tip. Data sources and existing data bases within each source include:

- **Mortality Data** are relatively easy to obtain from death certificates and are available from State and local agencies.

- **Hospital Admission and Emergency Department Data** generally provide accurate information about injuries serious enough to require hospital attention. Statewide hospital abstract services may routinely collect inpatient data from a large proportion of the hospitals in a State. National and State inpatient data are available from the National Hospital Discharge Survey conducted by the National Center for Health Statistics (NCHS).

- **Physicians** add knowledge about injuries severe enough to require physician attention but not hospital care. The National Ambulatory Medical Care Survey, also conducted by NCHS, collects information about a random sample of office visits from a representative physician sample.

- **Emergency Response Systems**, such as poison control centers, provide additional information about various injury results. One existing data base is the National Clearinghouse for Poison Control Centers, run by the Food and Drug Administration.

- **Households** contain data on parental knowledge behavior, attitudes, injury circumstances, and injury incidence—including injuries treated at home. The Health Interview Survey, conducted by NCHS, collects national data from a random sample of households.

- **Registries and Clearinghouses** may provide information on certain injuries and illnesses. Some States maintain such registries or clearinghouses. On a national level, the Consumer Product Safety Commission National Injury Information Clearinghouse maintains the National Electronic Injury Surveillance System (NEISS). NEISS collects emergency room data on product-related injuries.

- **Special Studies and Publications** contain valuable, but limited information on specific injuries. Federal studies, university research efforts, and voluntary organizations all collect and publish injury data.

- **Demographic and Socioeconomic Data** are required to compute denominators for epidemiological rates. These data usually are available from government sources.

(3) New Data Base Development

If information needed to plan an injury prevention program is unavailable from existing sources, consider developing new data bases. Developing new data bases is costly and time-consuming, so assess data needs carefully before undertaking such an effort. Consider three types of surveys: a hospital medical records survey, a household survey, and a physician survey.

A hospital medical records survey is politically and technically complicated. Obtaining hospital consent is extremely difficult and may take up to six months. The narrower the geographic scope and range of injuries under study, the easier such a study is.

Household surveys can be conducted in a geographic area or among a population in a closed setting such as a clinic. Household surveys conducted over a geographic area can be expensive, but costs can be reduced by using the telephone interview method, and all or part of an existing data collection instrument. Be sure and enlist an experienced firm to design and implement the survey.

Physician mail surveys can be useful, but obtaining cooperation may be difficult.

(4) Epidemiological Data Uses

Epidemiological data can produce injury rates that reflect incidence, death, and case fatality for the whole population and selected subgroups. These data also reveal circumstances of target injuries for high-risk populations for use in designing interventions.

4. GETTING STARTED: INITIAL PROGRAM PLANNING

Initial planning requires developing program support, setting goals and objectives and obtaining necessary resources. The first tasks in establishing a program are to: (1) identify other interested entities; (2) generate their support; and (3) create useful linkages to advance the program. Many agencies have an interest in childhood injury prevention. Through early contact, the program can identify key people, uncover potential duplication, and surface coordination possibilities. Start by determining which other State departments or health programs deal with children or injury prevention. Certain Federal agencies like the Public Health Service and the Consumer Product Safety Commission have an ongoing interest in injuries. Private sector businesses, professional, and voluntary organizations such as the medical society and teachers associations are also likely candidates.

Initiate contact by setting up meetings with department heads or organization leaders to explain the project and ask for support. Consider developing more formal linkages, by forming advisory committees. A Statewide Advisory Board with diverse membership can be called on for funding, political support, and programmatic input. A Coordinating Committee, composed of State agency representatives, can coordinate similar programs, be kept informed of progress and avoid duplication of effort.

Next, determine the geographic scope of the program. Will it focus on the whole State, selected regions, counties, or communities? If the focus is less than Statewide, decide which regions, counties or communities will be selected.

Move on to developing goals and objectives. Goals describe an ideal state; objectives are ends that must be met before the goal can be realized. Objectives should be measurable, time-limited, and area- or population-specific. Many programs find it difficult to predict quantified changes in behavior or injury rates. In such cases, process objectives that describe chronological program accomplishments may also be appropriate. Avoid being over ambitious; conservative objectives have the best chance of being achieved.

Program funding can be obtained from public and private sources. State government can use Maternal and Child Health or other block grant monies; Federal agencies can provide funds or technical assistance. Medical centers and university systems can supply expert consultants. Private sector business, especially health-related organizations, might be interested in assisting an injury prevention program. All funding sources require some form of written proposal. Tailor each proposal to the audience; proposals vary in length, content and formality. When appropriate, promote the proposal to decisionmakers through meetings, public hearings, and media coverage.

DESIGNING THE PROGRAM

5. FORMULATING THE STRATEGY

After learning what injuries are most problematic, which populations are of high risk, and what circumstances contribute to these injuries, strategy formulation can begin. A strategy is composed of one or several interventions; an intervention is a distinct activity having these components:

- A narrowly focused objective
- A selected population at-risk
- A target audience
- A design that spells out specific steps through which the prevention intervention will reach the target audience
- An implementation plan that discusses how the design will be realized
- A materials plan that describes the media through which the prevention intervention message will be conveyed

First, decide the targets of the strategy. On which injury types and populations at risk shall efforts be focused? The decision will be guided, of course, by overall objectives of the Maternal and Child Health Program and the epidemiological data. Within those constraints, however, three different targeting approaches are available:

- **Horizontal Targeting**--A horizontally-targeted strategy simultaneously attacks multiple injury types for which one age group is at risk. An example of this strategy is educating parents of one to three year olds about the poison, burn, fall, and motor vehicle hazards that their children face.

- **Vertical Targeting**—A vertically-targeted strategy pinpoints one injury, such as burns, and develops interventions aimed at the various types of burn hazards—excessive tap water temperature, hot liquid spills, fireworks, flammable liquids—for which each pediatric age group is at risk.

- **Specific Targeting**—A specifically-targeted strategy concentrates on a single problem that causes injuries for a particular age group. One illustration of this approach is a campaign to reduce aspirin poisoning of children under four by using childproof closures on containers.

These targeting approaches are not mutually exclusive; one, two, or all three approaches can be combined in one strategy.

Second, select the intervention categories and injury phases that will form the framework for choosing interventions. Interventions fall roughly into three categories:

- **Education**—Convincing parents and other responsible adults of the need for adopting injury prevention behaviors—e.g., keeping a child's own medicine (e.g., vitamins, aspirins) out of reach. All educational interventions promote active measures; they require behavior modification and individual action.

- **Technology**—Using engineering to reduce or eliminate hazards—e.g., cabinet locks for cupboards containing medicine, or medicine bottles packages with less than the fatal dose for children. The former is an active measure; the latter, which requires no individual action, is a passive measure. Both are designed to prevent poisonings.

- **Government Action**—Promulgating regulations and legislation to mandate changes in technology or behavior—e.g., requiring that all medicine be sold in childproof containers, or requiring that all medicine in State-licensed daycare centers be kept out of children's reach. Interventions based on government action can be passive, like the first example, or active, like the second.

The following matrix is useful in designing strategies:

Injury Phases	Intervention Categories		
	Education	Technology	Government Action
Pre-Event			
Event			
Post-Event			

A strategy can be comprised of interventions corresponding to a single, many, or all cells; the more cells addressed by interventions, the greater the chances for affecting targeted problem(s). Next, decide in which cells to concentrate interventions. A total educational strategy, for instance, can deliver prevention messages for all injury phases. This strategy would create parental awareness of burn hazards, encourage use of smoke detectors, and instruct parents in first aid techniques. Alternatively, a strategy can crosscut all intervention categories in a single phase. For example, a pre-event phase strategy can educate parents about the dangers of high hot water heater temperatures, lobby manufacturers to produce safer appliances, and convince authorities to pass appliance safety laws.

Finally, consider internal organizational and external community factors that may affect program choice. Internal factors include resources, time constraints, availability of pretested interventions, and limitations on State agency political activities. External factors include epidemiological data results, community readiness, health care provider support, and community leader support.

6. SURVEYING PREVENTION APPROACHES

Many interventions already have been implemented by the three Title V demonstration projects and others. Review diverse approaches to discover replicable interventions or to generate new intervention ideas. **Educational** interventions are the approach most often tried; making the public aware of childhood danger is often a necessary prelude to any intervention. Injury prevention education can be directed towards: (1) medical professionals in school or on the job; (2) parents in physician offices or clinics; (3) school children; and (4) the general public through businesses, community groups, and mass media.

Technological interventions involve developing and promoting methods to restrict release of the agent, and improving the emergency response to injuries that do occur. These interventions include: (1) creating safer recreational and livings areas; (2) promoting safer products; (3) encouraging use of safety equipment; and (4) establishing emergency response systems. **Government action** interventions mandate change through regulation and intervention. These interventions include: (1) enforcing existing regulations and laws; (2) creating new regulations; and (3) passing new legislation.

7. DESIGNING PREVENTION MATERIALS

Materials development provides an outlet for creativity, produces tangible results, and by doing so, generates staff investment and pride in the prevention program. First, decide what materials the program will develop. Most programs find it necessary to develop two types of materials: those that promote the prevention program overall and those that support prevention interventions. Basic public relations materials will be useful in letting caretakers, community organizations, health care providers, potential supporters and collaborators, and the press know that the program exists. These include an introductory brochure or flier, a newsletter, and a presentation.

Three principal types of prevention materials support interventions: (1) those that educate children, their caretakers, government officials, and the general public (e.g., poisonous plant handouts, first aid slide shows, draft legislation); (2) those that train or support prevention workers (e.g., counseling scripts, housing inspection surveys, treatment protocols); and (3) those that demonstrate actual safety supplies (e.g., ipecac, electrical outlet covers, kitchen cabinet locks).

Second, decide whether to make or buy materials. A program has four choices: (1) use existing materials "as is"; (2) tailor existing materials; (3) review existing materials to generate ideas; and (4) develop materials from the ground up. In the decision, balance cost, time, and convenience with adequacy. Most programs use a combination. Even programs that decide not to rely on existing materials can learn from the experience of others.

IMPLEMENTING AND EVALUATING THE PROGRAM

8. ORGANIZING AND ADMINISTERING THE PROGRAM

Organizing and administering a childhood injury prevention program involves deciding how the program will be structured, staffed, and implemented.

Three options exist for structuring a program: (1) developing an organization within the MCH unit; (2) contracting program design and implementation to an outside party, such as a poison control center; and (3) having a core staff in the MCH unit and using contractors to perform specific tasks. Issues surrounding choice of structure include control, management and coordination, institutionalization potential, administrative flexibility, geographic reach, and utilization of existing resources.

Although staffing depends on program strategy and the chosen structure, most prevention programs share similar staff requirements. Core staff usually includes most of these positions: Director or Medical Director; Program Director or Manager; Data Collection and Analysis Manager; Community Relations Director/ Health Educator; and Computer Programmer. Other technical skills (e.g., public relations, epidemiology) may be obtained through part-time help or consulting arrangements. Core staff can be extended by: (1) subcontracting specific tasks to

outside organizations (e.g., telephone surveys); (2) by using gatekeepers (e.g., pharmacists to distribute ipecac, public health nurses to counsel mothers); and (3) by using volunteers (e.g., community club members, student interns). Strategy and intervention design dictate how the program will be implemented. The three demonstration projects offer these general guidelines:

- Beware of underestimating the time required to complete certain tasks; everything takes longer than anticipated, especially when the tasks involved people outside the program staff. When scheduling, break each task into components and systematically imagine obstacles to its completion. Be sure and leave enough time for the planning phase and count on a two- to three-year implementation period if institutionalization is desired.

- Data processing can be expensive; take into account dollars required to process and analyze data when designing the form. Eliminate unnecessary data elements.

- When choosing materials, anticipate the cost over the years. Balance potential cost-savings for bulk quantities with possibility that materials will require revision.

Careful monitoring of implementation is essential to program success, particularly when subcontractors, gatekeepers and volunteers are involved. Use meetings, reports, forms, and visits to monitor interventions.

9. SELECTING AND WORKING WITH LOCAL COMMUNITIES

Although some interventions can be implemented statewide, others are best focused on smaller geographic areas—e.g., regions, counties, or communities. Choosing appropriate communities and earning their support are critical tasks. Criteria include: a serious childhood injury problem; community characteristics; a highly organized and supportive health care system; an identifiable and supportive community power structure; and community location in relation to program staff location.

Support by community leaders can open doors to gatekeepers, make resources available, and promote the program generally. All three demonstration projects offered hints about developing relationships with community organizations:

- Obtain the support of the medical and political leadership first.

- When soliciting support, send a program representative with credentials and professional stature that engenders respect.

- Be sensitive to other organizations' needs. Explain how the program can help them rather than how they can help the program.

- Communicate frequently; share feedback and data.

- Design interventions that directly respond to community needs.
- Offer technical assistance to communities that wish to develop their own programs.

Consider formalizing relationships by establishing a community advisory board. Use board expertise to solve specific problems, open doors, generate ideas, and uncover resources. Do not allow the board to run the program or develop policy. Select members **after** choosing a strategy. Pick both people with high visibility and people who have time to work with the program. Balance community leaders and technical experts.

10. EVALUATING THE PROGRAM

Evaluation is an important component of overall program design and serves three purposes. First, knowing which interventions were effective affects the decision about which interventions to replicate or replace. Second, good evaluation data can sway funding sources. Third, evaluation data can advance the state of knowledge in the injury prevention field.

A good evaluation begins with a good design, one that is built into the program from its inception. The evaluation can be organized using three categories of measures: input measures that describe program planning; process measures that describe program implementation; and impact measures that describe program outcome. Select key measures in each category that best explain program results. Input data usually exist in the files; process data can be collected routinely during program monitoring. Impact measures require that new data be collected. Limit these data items because collecting data is expensive. Do not rely solely on injury rates to demonstrate impact. Injury incidence is often low. In addition, educational programs can succeed in increasing knowledge, but their effect on behavior and injury rates diminish over time.

Evaluation design are of two main types: longitundinal and direct measures. Longitudinal studies involve before and after comparisons on impact measures among target populations. These studies can be conducted within one target population or as part of an experimental design containing target and control groups. Control groups help estimate what changes might have taken place had the program not been implemented. Direct measure studies are frequently of the case control type. For instance, a case control study may attempt to determine the effect on intervention exposure on the likelihood of being injured and to assess the extent to which the intervention permeated the target group.

Evaluation data analysis will vary depending on the design, measures, data sources, and data collection procedures. Changes in impact measures can be compared using appropriate statistical techniques. The extent to which input and process can be related to change in outcome depends on how well explanatory measures are quantified. Statistical interpretation of casual relationships may be limited because much data is qualitative. Seek assistance from statisticians in determining useful analytic techniques.

Thoroughly explore potential difficulties and design the evaluation to minimize them. Possible problems include:

- A small sample size, a short time horizon, and resulting low numbers of injured children limits the applicability of many statistical techniques; make sure the sample size is big enough and the implementation period long enough to permit significant differences to emerge.

- Extraneous events (e.g., a house fire, promotion of a national prevention campaign) can influence the same measures the program is hoping to influence. Keep abreast of related happenings in the target and control communities.

- Test bias may occur when the household survey is administered to the same group pre- and post-intervention. Because respondents learn from surveys, replace part of the pre-intervention samples with new interviewees.

- It is difficult to separate the effects of multiple interventions on a single community. For instance, if parents are buying more ipecac, it may be because physicians suggested it during an anticipatory guidance session, because pharmacists recommended it, or because the childbirth educator mentioned it. A household survey can help uncover reasons for particular changes.

INTRODUCTION

As medical advances have conquered the infectious diseases of childhood, unintentional injuries have emerged as the major cause of death among children up to 14. Each year, many children are injured unintentionally, requiring medical attention or hospitalization and resulting too often in permanent disability and death. These occurrences are not fated accidents. Rather, many stem from predictable circumstances and can be prevented.

This Manual provides State MCH Programs with an action guide for developing targeted childhood injury prevention programs. Although it draws from many sources, it is based primarily on the experience of three childhood injury prevention demonstration projects supported by Title V MCH funds as special projects of regional and national significance. Funded in 1979 for a three- to four-year period by the DHHS Division of Maternal and Child Health,* co-sponsored by the Division of Emergency Medical Services,* the projects were conducted under the auspices of State health departments in California, Virginia, and Massachusetts:

- The California project was carried out by the University of California Medical School, in San Diego, under the direction of Sylvia Micik, M.D.; Kathleen Grossman, M.A. administered the project. Dr. Micik can be contacted at Childhood Accident Prevention Project, San Diego Poison Control Center, University of California Medical Center, University Hospital, 225 Dickinson Street, H-226, San Diego, California 92103, (714) 294-3578.

- The Virginia project was implemented jointly by the Medical School under the direction of Lorne Garrettson, M.D., and Daniel Spyker, M.D. Ruth Buck, M. Ed., acted as administrator for both project offices. Dr Garrettson can be reached at the Central Virginia Poison Control Center, Medical College of Virginia, Virginia Commonwealth University, Richmond, Virginia, 23298, (804) 786-4780. Dr. Spyker can be contacted at the Blue Ridge Poison Control Center, University of Virginia Medical Center, Charlottesville, Virginia 22908 (804) 924-5543.

- The Massachusetts project was located in the State Title V agency, the Division of Family Services, Public Health Department. Bernard Guyer, M.D., M.P.H., was principal investigator; Susan S. Gallagher, M.P.H., directed the project. Ms. Gallagher can be reached at the Statewide Childhood Injury Prevention Project, Massachusetts Department of Public Health, 39 Boylston Street, Boston, Massachusetts 02116, (617) 727-1246.

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* Both located in the Bureau of Health Care Delivery and Assistance, Health Resources and Services Administration, Public Health Service.

All project directors expressed their willingness to assist other developing injury prevention programs.

Over the three year grant period, each project:

- Conducted an epidemiological study
- Developed a strategy and specific interventions targeted to the age groups at-risk for especially problematic injuries
- Implemented the strategy and interventions in one or more target communities
- Evaluated project results

This Manual is organized to reflect this approach. It contains much "how-to" information, specific examples, and helpful hints. The Manual can be used to develop a total program from the ground up, to implement separate program components, or to improve or expand existing programs. It is divided into four sections:

BACKGROUND

Chapter I: Unintentional Injury Among Children reviews the current epidemiological picture of childhood injuries and demonstrates the need for injury prevention programs.

Chapter II: Concepts Employed In Injury Prevention summarizes concepts for identifying injury factors, generating countermeasures, and selecting countermeasures.

PART A—PLANNING THE PROGRAM

Chapter III: Assessing State Need By Collecting Epidemiological Data discusses how to collect and analyze epidemiological data about childhood injuries.

Chapter IV: Getting Started: Initial Program Planning outlines how to develop support for the program, set goals and objectives, and obtain resources.

PART B—DESIGNING THE PROGRAM

Chapter V: Formulating The Strategy explains how to target the strategy and describes how to select and sequence strategy components.

Chapter VI: Surveying Prevention Approaches examines educational, technological, and government action interventions already implemented by childhood injury prevention projects or suggested by experts.

Chapter VII: Designing Prevention Materials provides guidance in developing materials to promote the program overall and to support specific interventions.

PART C—IMPLEMENTING AND EVALUATING THE PROGRAM

Chapter VIII: Organizing And Administering The Program addresses issues of program structure, staffing, and implementation.

Chapter IX: Selecting And Working With Local Communities considers factors that are important in choosing target communities and gaining community support.

Chapter X: Evaluating The Program presents an evaluation approach to determining program effectiveness.

CHAPTER ONE

I. UNINTENTIONAL INJURY AMONG CHILDREN, ADOLESCENTS, AND YOUNG ADULTS: SCOPE OF THE PROBLEM

Public concern over unintentional injury can be linked in part to medicine's great success against communicable diseases, particularly those of childhood. With the decline of mortality and morbidity from these causes, unintentional injury has emerged as a major threat to our lives and our well-being. Between 1900 and 1978, for instance, unintentional injury climbed from seventh to fourth on the national list of major killers. The figures are even more striking for children and young people who suffer unintentional injury at much higher rates than the middle-aged or the elderly. Thus, while the death rate for children age one to 14 plummeted from 870 per 100,000 in 1900 to 43 per 100,000 in 1978, accidents became the number one killer of persons in this age group (Bauer and Wilson, 1981). For their part, adolescents and young people age 15 to 24 suffer such a heavy loss from unintentional injury that the death rate for this group was higher in 1978 than in the late 1950s, despite all medical advances and despite the emergence of a nationwide network of sophisticated emergency medical services (Bauer and Wilson, 1981).

Mortality data, however, are only the iceberg's tip. The Massachusetts demonstration project epidemiological data vividly illustrates this statement. Of the 19,076 injuries suffered by children age 0-19, 96.7 percent required only emergency room treatment; 3.2 percent required hospital admission; and only 0.1 percent of the injuries resulted in death.

The following sections further describe the unintentional injury problem. Mortality and morbidity data are reviewed and risk factors are discussed.

1. MORTALITY FROM UNINTENTIONAL INJURY

Table 1, following this page, displays latest official mortality figures and rates by cause of death for specific age groups. As documented on the table, "accidents" account for only a small proportion of the deaths suffered by children under one year old—1,262 of 45,945 or 2.7 percent. But after the conditions and complications of infancy, unintentional injury is the number one killer of our young. It accounts for 41.6 percent of the 8,429 deaths among one to four year olds, 50.9 percent of the 12,030 deaths among five to 14 year olds, and 54.9 percent of the 48,500 deaths among individuals 15 to 24.

Figure 1 compares accidental death rates by cause for specific age groups. As illustrated, the mix and relative frequency of etiologic factors vary by age group:

- **Motor vehicle injuries** (including pedestrian and pedicycle injuries) are a serious threat to all age groups, being the number one cause of accidental death for individuals age one to 24 and the second leading cause of accidental death for those under one. Young people 15 to 24 run a high risk of motor vehicle death, which accounted for 72 percent (19,164) of the 26,622 accidental deaths among them.

TABLE 1

LEADING CAUSES OF DEATH FOR ALL AGES AND BY AGE GROUP

	NUMBER OF DEATHS [a]	DEATH RATE [b]
ALL AGES	1,927,788	883
Heart Disease	729,510	334
Cancer	396,992	182
Stroke [c]	175,629	80
ACCIDENTS	105,561	48
Motor-Vehicle	52,411	24
Falls	13,690	6
Drowning	7,026	3
Fires, Burns	6,163	3
Other	26,271	12
UNDER ONE YEAR	45,945	1,434
Anoxia	9,556	298
Congenital Anomalies	8,404	262
Complications Of Pregnancy And Childbirth	5,544	173
Immaturity	3,677	115
Pneumonia	1,499	47
ACCIDENTS	1,262	39
Ingestion Of Food, Object	296	9
Motor-Vehicle	264	8
Mech. Suffocation	242	8
Fires, Burns	154	5
Other	306	9
ONE TO FOUR YEARS	8,429	69
ACCIDENTS	3,504	29
Motor-Vehicle	1,287	11
Fires, Burns	724 [d]	6
Drowning	630 [d]	5
Ingestion Of Food, Object	167	1
Falls	121	1
Other	557	5
Congenital Anomalies	1,027	8
Cancer	599	5
FIVE TO FOURTEEN YEARS	12,030	34
ACCIDENTS	6,118	17
Motor-Vehicle	3,130 [d]	9
Drowning	1,010 [d]	3
Fires, Burns	586	1
Firearms	2[illegible]	1
Other	1,095	3
Cancer	1,500	4
Congenital Anomalies	650	2
FIFTEEN TO TWENTY-FOUR YEARS	48,500	118
ACCIDENTS	26,622	64
Motor-Vehicle	19,164 [d]	46
Drowning	2,180 [d]	5
Firearms	581	1
Poison (Solid, Liquid)	3[illegible]	1
Other	4,120	11
Homicide	5,443	13
Suicide	5,115	12

Source: Accident Facts, National Safety Council, 1982 Edition.

[a] Deaths are for 1978, latest official figures from National Center for Health Statistics, Public Health Service, U.S. Department of Health and Human Services.

[b] Deaths per 100,000 population in each age group. Rates are average for age groups, not individual ages.

[c] Cerebrovascular disease.

[d] Partly estimated.

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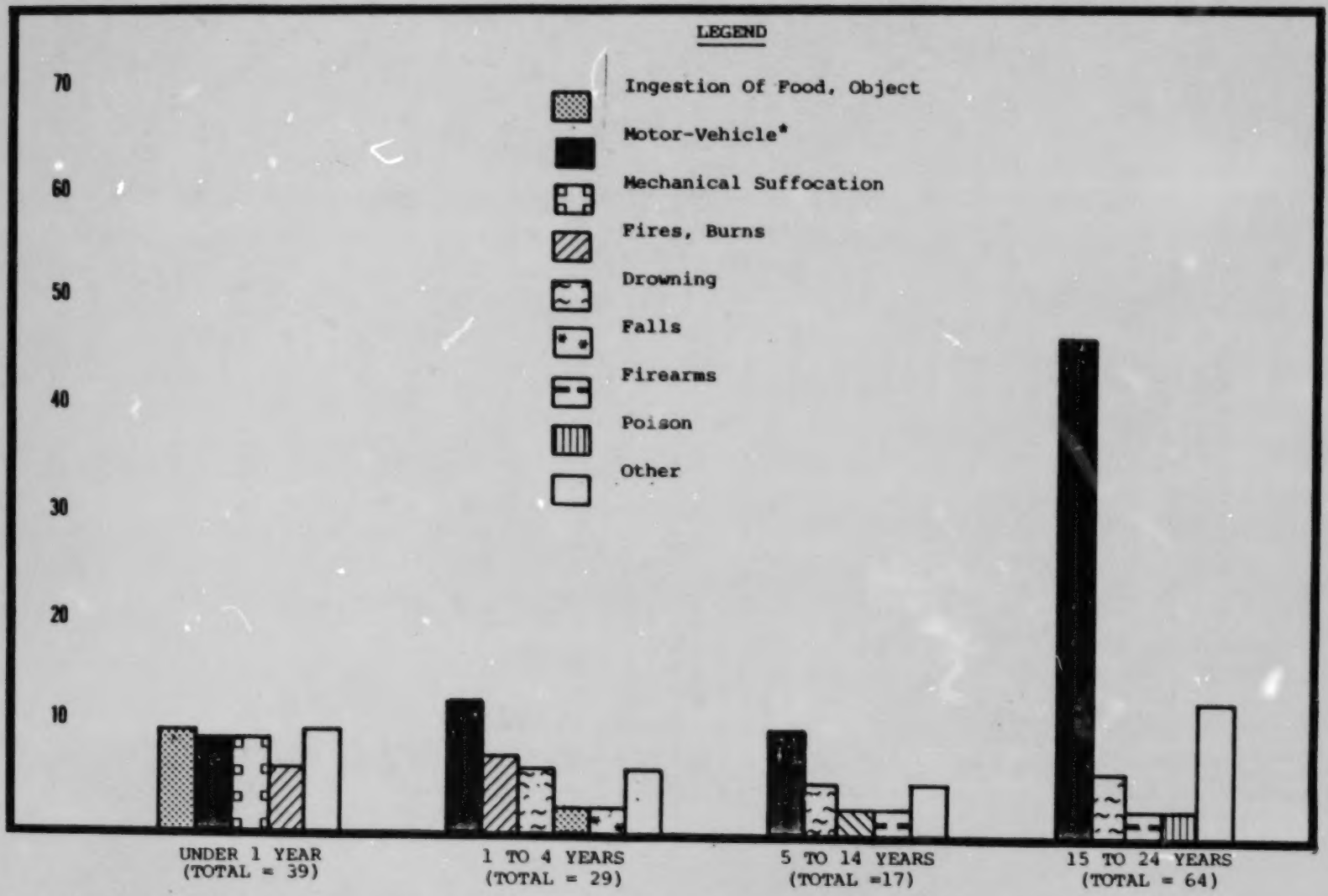
FIGURE 1

FATALITIES FROM UNINTENTIONAL INJURY



* The motor vehicle category also includes pedestrian and pedacycle injuries.

SOURCE: Accident Facts, National Safety Council, 1982 Edition.

- **Ingestion of food or other foreign object** ranks high among risks to children under one but disappears from the list of leading causes of accidental death after age four.

- **Mechanical suffocation** ranks as a leading threat only to those under one.

- **Death from fires and burns** is the fourth leading cause of accidental death among children under one and second among those age one to four. In contrast, death by fire or burn occurs to only one in 100,000 in the five to 14 age group and is not in the upper rankings for those age 15 to 24.

- **Drowning** emerges as a leading cause of accidental death after the first year of life, ranking third among those age one to four and second among those five to 14 and 15 to 24.

- **Firearms** become a leading cause of accidental death at age five to 14, tied with fires/burns for third place in this age group; among those 15 to 24, firearms continue as the third leading cause of accidental death, tied in this case with poison.

- **Poison itself** does not emerge as a leading cause of accidental death until age 15 to 24.

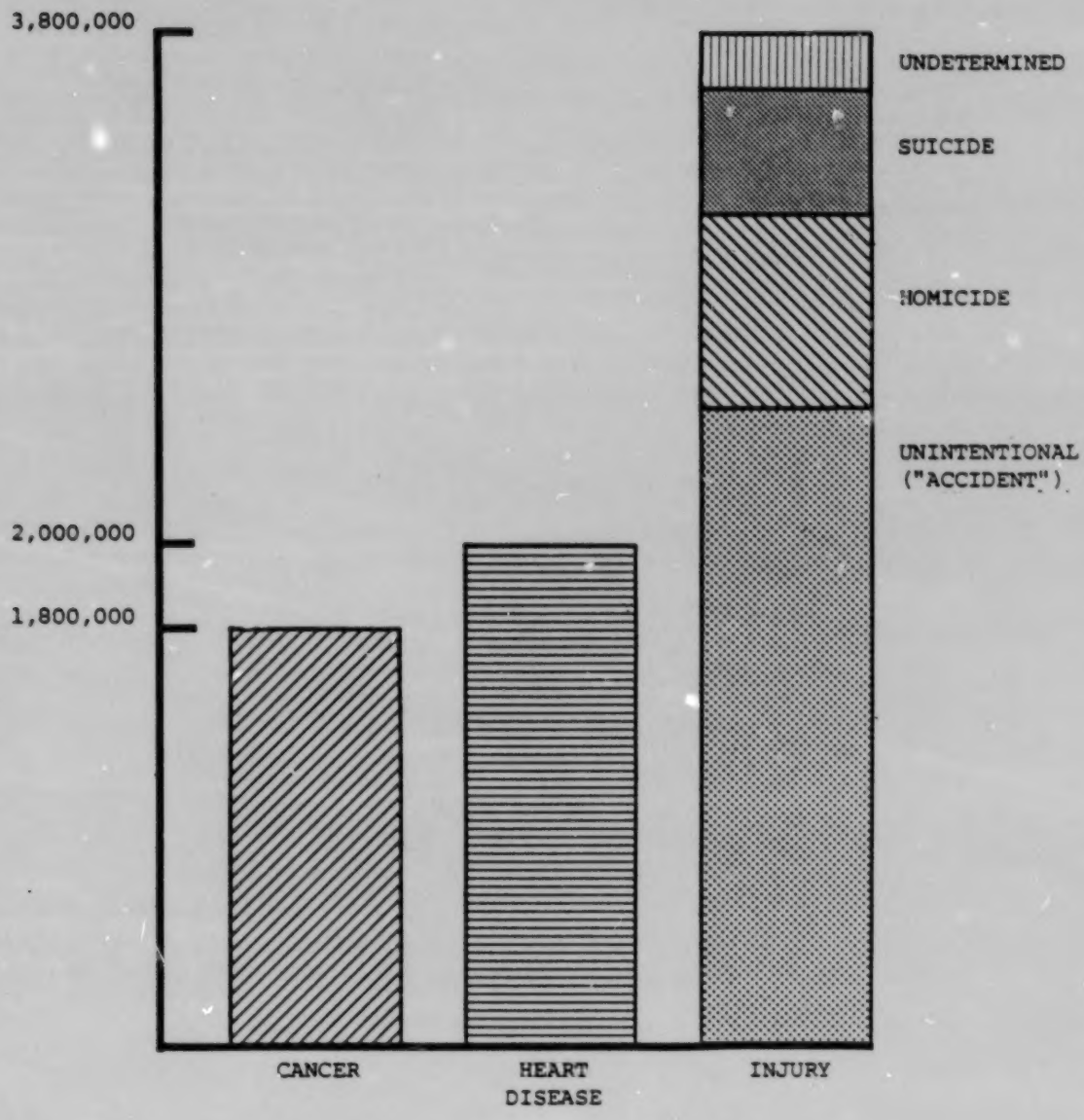
Table 1 and Figure 1 reveal that death rates from unintentional injury, though far higher than death rates from other causes, still appear to be quite low, with the exception of motor vehicle injuries among young people 15 to 24.

Death rates alone, however, are a meager measure of fatal injury among the young. Years of life and productivity lost are more telling measures. Although it is impossible to quantify the private tragedy of a child's death, it is possible to estimate the public costs involved. Calculations of total years of life or years of working life foregone are relatively straightforward.[1/] Figure 2, following this page, compares annual loss of working years attributable to cancer, heart disease, and injury.

1/ To estimate years of life lost to a specific cause, multiply the number of persons dying in a given year from a given cause by the life expectancy at that age (e.g., 65 years of remaining life at age 10). This computation "gives added weight ... to 'younger' causes of death like burns as compared to the 'older' causes of death like cancer and heart disease" (Feck et al. 1978). To calculate loss of working years, multiply the number of people who died from cancer, heart disease, and injury in each five-year age group from 0 to 64 by the number of years between ages 18 and 64 that would have remained to them had they lived (Centers for Disease Control, 1981a). The estimates again reveal the importance of injury deaths among the young.

FIGURE 2

WORKING YEARS OF LIFE



SOURCE: Center for Environmental Health, Centers for Disease Control, Atlanta, Georgia. Final Report Under Contract #200-80-0517.

2. MORBIDITY FROM UNINTENTIONAL INJURY

Morbidity data, even more than mortality data, capture the magnitude of the unintentional injury problem. Morbidity data encompass many different degrees of injury severity. Most available morbidity data focus on injuries requiring inpatient care. The demonstration projects, however, compiled more detailed statistics through emergency department studies and household surveys.

(1) The Incidence Of Morbidity From Unintentional Injury—The National Picture

Table 2, following this page, presents data on injuries and other acute conditions collected in the 1981 National Health Interview Survey. Children under 16 experienced 23 million injury incidents in 1981 (36.7 injuries per 100 person years in the under six age group and 40.3 injuries per 100 person years in the six to 16 age group).

The National Health Interview Survey also provides data on days of bed disability, days of restricted activity, and days lost from school as a result of specific acute conditions. Figures for injury, though not among the highest, are considerable:

- **Days of Bed Disability**—Children between six and 16 were confined to bed by injury for more than 11 million days in 1981, at a rate of 29.1 days per 100 person years. (Reliable estimates could not be developed for children under six.)

- **Days of Restricted Activity**—Injury accounted for more than eight million days of restricted activity in children under six and more than 58 million days among children six to 16, for a rate of 41.4 restricted activity days per 100 person years in the younger group and 150.7 restricted activity days in the older group.

- **Days Lost From School**—In 1981, injuries accounted for over 14 million days lost from school by children six to 16 , at a rate of 36.5 days per 100 person years.

These figures suggest the tremendous private and public loss associated with injury-related morbidity among the young. To illustrate, with the cost of an instructional day running at about $13 per pupil,* children six to 16 lost some $184 million worth of instruction as a result of injuries suffered in 1981.

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* Personal communication with the National Center for Education Statistics; the dollar amount represents average costs for the 1979-1980 school year.

TABLE 2

INCIDENCE OF ACUTE CONDITIONS AND NUMBER OF ACUTE CONDITIONS PER 100 PERSONS PER YEAR, BY AGE, SEX, AND CONDITION GROUP: UNITED STATES, 1981

CONDITION GROUP	ALL AGES	UNDER 6 YEARS	6-16 YEARS	17-44 YEARS	45 YEARS AND OVER	ALL AGES	UNDER 6 YEARS	6-16 YEARS	17-44 YEARS	45 YEARS AND OVER
BOTH SEXES	INCIDENCE OF ACUTE CONDITIONS IN THOUSANDS					NUMBER OF ACUTE CONDITIONS PER 100 PERSONS YEAR				
All Acute Conditions	478,047	76,434	106,979	211,373	83,262	212.4	380.0	275.9	217.6	120.6
Infective And Parasitic Diseases	53,185	12,015	14,744	20,957	5,469	23.6	59.7	38.0	21.6	7.9
Respiratory Conditions	251,802	40,078	57,845	108,051	45,828	111.9	199.3	149.2	111.2	66.4
Upper Respiratory Conditions	125,399	25,445	30,948	50,025	18,981	55.7	126.5	79.8	51.5	27.5
Influenza	111,847	11,464	24,492	52,566	23,326	49.7	57.0	63.2	54.1	33.8
Other Respiratory Conditions	14,555	3,168	2,406	5,460	3,521	6.5	15.8	6.2	5.6	5.1
Digestive System Conditions	21,771	2,039	5,945	10,262	3,526	9.7	10.1	15.3	10.6	5.1
Injuries	74,660	7,379	15,629	36,898	14,754	33.2	36.7	40.3	38.0	21.4
All Other Acute Conditions	76,629	14,922	12,817	35,205	13,685	34.1	74.2	33.1	36.2	19.8

Source: Current Estimates from the National Health Interview Survey: United States, 1981. Series 10, Number 141.

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Table 3 notes the top 10 product groups involved in injuries that are seen in the emergency department. The National Electronic Injury Surveillance System (NEISS) run by the Consumer Product Safety Commission, collects these data from a nationwide sample of emergency departments. Stairs, steps, and ramps are most frequently cited. Bicycle and sports activities, apparel and equipment also rank high on the list.

(2) The Incidence Of Morbidity By Unintentional Injury Type—A State Overview

Massachusetts epidemiological data revealed a yearly injury rate of 2,192 per 10,000 children. Each year roughly one of every five children in Massachusetts experiences an injury severe enough to require hospital attention (Gallagher et al. 1982). Figure 3 describes selected injury rates by type of accident for three age groups: five, six to 12, and 13 to 19. Emergency department visits, inpatient admissions, and deaths are combined, presenting a complete injury incidence picture. Injuries exhibiting the highest rates are noted below:

- **Falls** rank as the number one injury cause for children 12 and under; Preschool children are at the greatest risk of suffering non-sports-related falls; their falls occur primarily in the home and are associated with stairs or furniture (e.g., fell and hit head on table). Falls rank as the fourth leading injury cause among teenagers.

- **Sports injuries** are the major injury cause for children age 13 to 19; one out of every 15 teenagers receives a sports-related injury each year. Sports injuries are the fourth most frequent injury for children six to 12, but are negligible for children under five.

- Injury rates caused by being **struck by an object**, (e.g., slammed finger in door) or by a **cutting** or piercing instrument (e.g., knives, broken glass) have the next two highest injury rates; both rates increase with age.

- **Transportation-related injury** rates appear high in only two categories: teenage motor vehicle occupants and pedal cyclists age six to 12. (These pedal cycle injuries do not involve collision with a motor vehicle.)

- **Burns, Poisons and Foreign Bodies** injuries are most problematic for preschoolers, decrease for elementary school age children, and increase again for teenagers. The etiology differs significantly for the two age groups with high rates. For instance, preschool burns occur in the kitchen and involve hot liquid scalds, hot surfaces, and electricity; many teenage burns are occupationally-related and involve contact with a hot surface or flame.

Table 3

Products Involved in Injuries
July 1, 1980–June 30, 1981

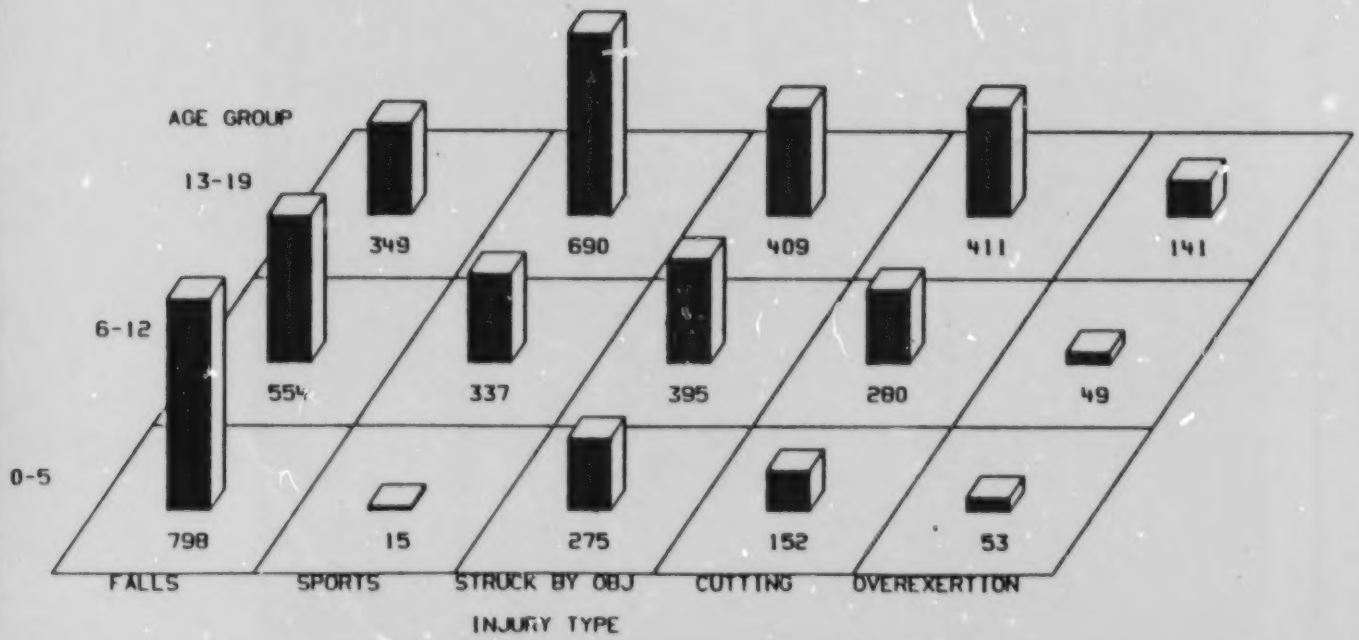
Rank	Product Group	Estimated Emergency Department Visits
1	Stairs, steps, and ramps	763,000
2	Bicycles and bicycle accessories	518,000
3	Baseball activities, apparel, and equipment	478,000
4	Football activities, apparel, and equipment	470,000
5	Basketball activities, apparel, and equipment	434,000
6	Nails, carpet tacks, screws, and thumbtacks	244,000
7	Chairs, sofas, and sofabeds	236,000
8	Roller skating and ice skating activities, apparel, and equipment	225,000
9	Non-glass and unspecified tables	225,000
10	Glass doors, windows and panels	208,000

Source: National Electronic Injury Surveillance System Annual Report, 1981. Appendix A. Washington, D.C.: Consumer Product Safety Commission, 1982.

FIGURE 3(1)

SELECTED INJURY RATES BY AGE GROUP

ANNUAL INCIDENCE RATES PER 10,000 CHILD YEARS
September 1980 - August 1981



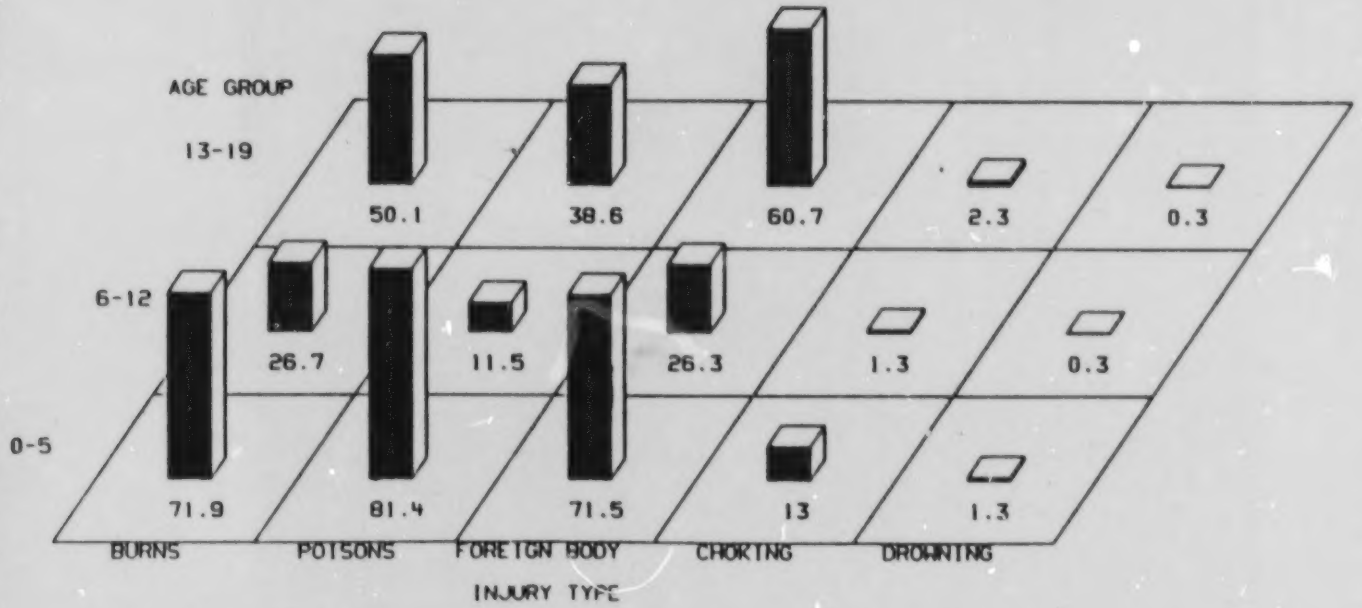
Source: Massachusetts Statewide Childhood Injury Prevention Project

FIGURE 3(2)

SELECTED INJURY RATES BY AGE GROUP

ANNUAL INCIDENCE RATES PER 10,000 CHILD YEARS

September 1980 - August 1981

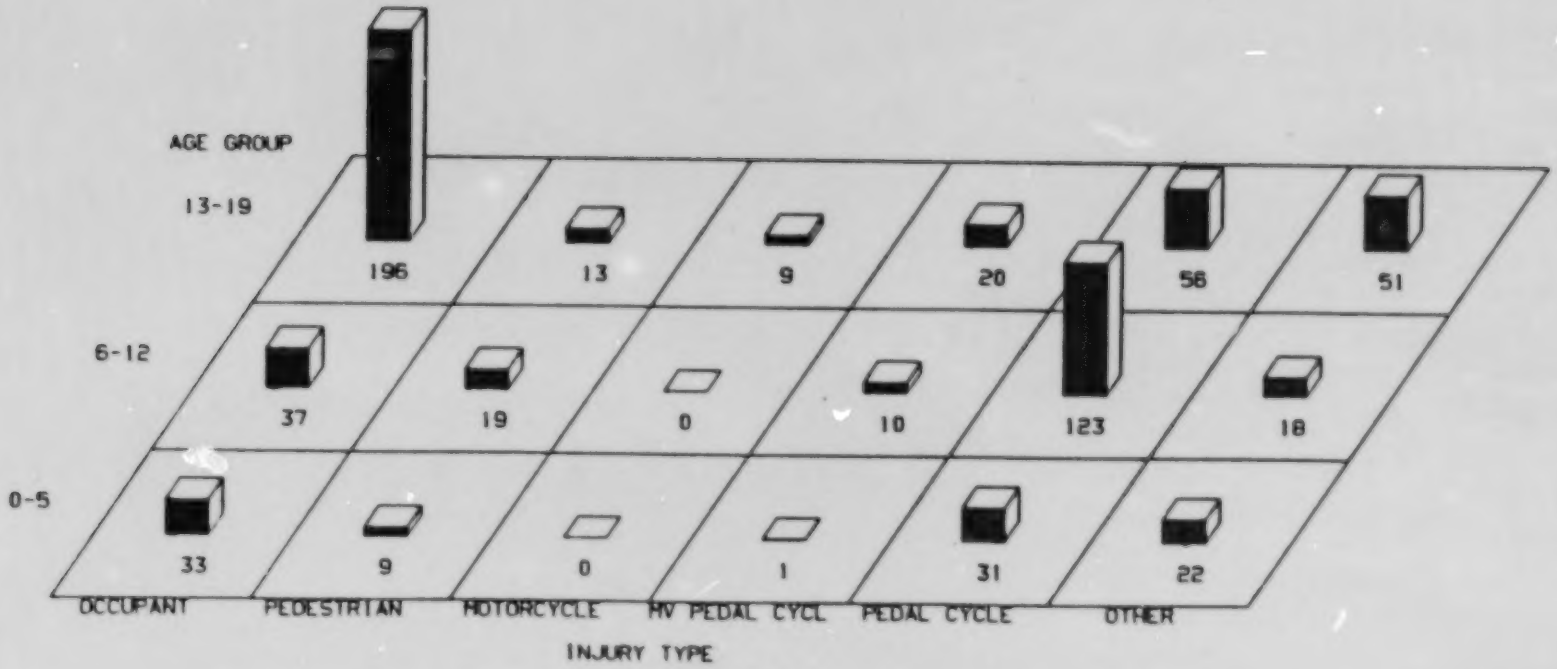


Source: Massachusetts Statewide Childhood Injury Prevention Project

FIGURE 3(3)

SELECTED INJURY RATES BY AGE GROUP

ANNUAL INCIDENCE RATES PER 10,000 CHILD YEARS
September 1980 - August 1981



Source: Massachusetts Statewide Childhood Injury Prevention Project

In summary, Massachusetts preschool children under six are at greatest risk for falls, being struck or cut by an object, and poisonings. Elementary school age are most likely to sustain falls, being struck by an object, and sports injuries. Teenagers are injured most often through sports, and by being struck or cut by an object.

Morbidity resulting from certain injury types may have excessive impact on the health care system. For instance, a large-scale burn study conducted in upstate New York (Feck et al., 1978) found the average length of stay to be 16 days for all burn patients and 22 days for those admitted to special treatment units. These rates are considerably higher than the average length of stay for all hospital patients—eight days. Moreover, the cost of burn treatment was exceedingly high, ranging from $400 to $700 a day in 1977, compared to $136 a day average for all patients in 310 upstate New York hospitals.

Finally, a vast discrepancy exists between morbidity and mortality rates; frequently occurring injuries may cause few deaths. Table 4 presents data generated by the Virginia project and reveals a typical picture. Injuries from poisons, burns, falls, submersions, and bicycles/skates resulted in 11,639 ED visits, 1,149 hospital admissions, and 10 deaths. The most frequent injury category, falls, illustrates this relationship particularly well. Of 4,853 ED visits prompted by falls, three ended in death, a ratio of 1,618:1.

3. THE DISTRIBUTION OF UNINTENTIONAL INJURY

Three types of risk factors influence injury type and distribution: child characteristics, family characteristics, and community characteristics.

As can be seen from information already presented, **child characteristics**, particularly age, are major determinants of the injury type and cause. Younger children suffer injuries resulting from a combination of curiosity, lack of experience, and poor muscle strength and coordination. According to the California project household survey, children up to three are at the greatest risk of poisoning from ingesting household products, while children four to 11 are at the greatest risk from drugs such as vitamins or adult medication. Gender also plays a limited influencing role. The California household survey data indicated that among children up to 14, males had a higher burn incidence than females. Of 93 reported incidents, 59 involved males and 34 involved females, a 1.7:1 ratio. Among children birth to three, who have the highest risk for burns, the male/female ratio is even more dramatic—9:1.

Family characteristics that affect injury rates include income, race or ethnicity, education, and whether both parents work. Little conclusive data are available about the way those factors influence injury, but the California survey compared actual to the expected number of incidents and found:

- Members of households with income $10,000 and under had 89 percent more burns, those with income between $11,000 and $25,000 had 54 percent more burns, and those with incomes above $25,000 had 30 percent less burns than expected.

TABLE 4

MORBIDITY AND MORTALITY RATES
BY INJURY TYPE
VIRGINIA DEMONSTRATION PROJECT

	NUMBER ED VISITS	NUMBER ADMITTED	PERCENT ADMITTED	TOTAL HOSPITAL DAYS	NUMBER OF DEATHS	RATIO OF ED VISITS TO DEATH
Poisoning	2,520	346	13.7 %	1,595	4	630:1
Burns	951	88	8.4 %	NA	NA	NA
Falls	4,853	434	8.9 %	688	3	1,618:1
Submersions	21	5	23.8 %	5	3	7:1
Bikes/Skates	3,294	276	8.4 %	720	0	--
Totals	11,639	1,149	9.9 %	3,051	10	

- In contrast, households in which the respondent's spouse (usually the male head of household) had completed less than 12 grades of school had 47 percent fewer poisonings while those with more education (and presumably higher incomes) had slightly more poisonings.

- Hispanics had lower injury frequency at all income and schooling levels; the deficit was most pronounced at lower income and education levels.

Specific injuries generally can be correlated with a combined measure of socioeconomic status. For example, a pediatric drowning profile revealed the proportion of swimming pool drownings was greatest among white persons in the higher socioeconomic strata.

Community characteristics can influence injury type and distribution. For instance, burns from wood stoves might be higher in a cold northeastern state like Vermont. Swimming pool drownings may be greater in a warm western state like California. Factors like the age of the community housing stock also may be considered. For example, older housing may lack adequate fire prevention equipment or have walls covered with lead-based paint.

In conclusion, unintentional injuries pose serious threats to health and well being among children. The next Chapter explores concepts for understanding the epidemiology of childhood injuries and frameworks for identifying countermeasures to solve this problem.

CHAPTER TWO

II. CONCEPTS EMPLOYED IN INJURY PREVENTION

The field of injury prevention is based on the perception that most human injuries are not accidental—not entirely random, unexpected events. Instead, they arise somewhat predictably from certain interactions between people; the machines, vehicles, and substances they use; and the complex environments in which they live, work, and play. This view encourages the careful analysis of injury events and the search for effective countermeasures, as described below.

1. CONCEPTS USEFUL IN IDENTIFYING INJURY FACTORS

DeHaven (1942), Gibson (1961), and Haddon (1963) advanced the study of injury by promoting the classic epidemiological triad of host-agent-environment as a framework for observing and analyzing injury events. Haddon applied these basic epidemiological concepts to instances of injury. Specifically, injury results from an energy exchange between the **agent** (chemical, mechanical, thermal or electrical energy, or radiation) and the **host** (the individual who is overcome by an influx of energy). Agent and host are brought into contact by another individual or by a machine, appliance, tool, or substance (comparable to "vectors" and "vehicles" in the epidemiology of communicable disease); by some element of the environment; or by a combination of such factors.

Adapting medicine's concept of primary, secondary, and tertiary prevention to the injury situation, Haddon and others also have emphasized the importance of considering pre-event, event, and post-event factors. In the pre-event phase, factors combine to create the **potential** for injury. In the event phase, some factors reduce while others increase the **severity** of injury. Finally, certain factors in the post-event phase influence the **outcome** of injury. For instance, high speed and slippery pavement increase the likelihood of a car crash; hard interior surfaces and protrusions increase the likelihood that a crash will result in injury; after the event, moving the victim carelessly compounds the original injury.

Haddon developed a matrix (Table 5 below) for assuring the orderly and exhaustive consideration of these variables. The matrix shows the three injury phases along

Table 5

INJURY CONTROL MATRIX

	FACTORS		
PHASES	Human	Equipment	Environment
Pre-Event			
Event			
Post-Event			

the vertical axis and injury factors along the horizontal. The "human" category includes the host and any caretakers or other individuals who contribute to the interaction between host and agent. The "equipment" category includes vehicles, machines, appliances, tools, or substances that cause or contribute to the injurious interaction. The "environment" category includes socioeconomic as well as physical features.

Operating from an epidemiological perspective, researchers have attempted to accumulate findings on injury factors. Because unintentional injuries often are associated with discrete activities, considerable attention is paid to the precise nature of these activities. Table 6, following this page, lists factors of common interest and suggests that the study of injury may be pursued at varying levels of detail. For instance, epidemiological surveys undertaken to identify appropriate targets for interventions typically report on the frequency and, in some cases, the severity of one or more injury types by sex and age of the injured party. Once suitable targets are identified (e.g. drownings among 15 to 20 year olds in County X), more detailed study is required to determine the relative weight of etiological factors. The Haddon matrix is useful for considering all possibly relevant influences. Once significant injury factors have been identified, the task of designing countermeasures can begin.

2. CONCEPTUAL TOOLS FOR GENERATING COUNTERMEASURES TO UNINTENTIONAL INJURY

Thoughts about possible countermeasures can be stimulated by asking three basic questions. (1) how can the host's vulnerability to the agent be eliminated or reduced; (2) how can the agent's injurious potential be reduced or eliminated; and (3) how can contact between host and agent be prevented or limited? The injury prevention field has developed several conceptual approaches for considering these questions. Each is based on a specific etiological model of injury and is discussed below.

(1) The Energy Reduction And Control Approach

Haddon's 10 countermeasures reflect the perception that injury arises from an energy exchange. Logically, then, injury is countered by preventing the exchange, reducing its intensity, or strengthening the host. Haddon's countermeasures are as follows:

(1) Prevent the marshalling of potentially injurious agents

(2) Reduce the amounts of potentially injurious agents

(3) Prevent inappropriate release of the agent

(4) Modify release of the agent

(5) Separate agent from individuals at risk in space time

(6) Separate agent from individual at risk with physical barriers

TABLE 6

INJURY FACTORS OF COMMON INTEREST

ACTIVITY

Tasks demanded
Level of supervision (e.g., coaching, officiating)
Number of participants
Rules of the game
Risks involved
Safety measures employed
Participant's attitudes
Etc.

HOST ATTRIBUTES

Age
Sex
Height
Weight
Condition
Race, ethnicity
Skill level
Disabilities
Drug/alcohol use
Schooling
Experience
Insured/uninsured
Native language
Protective equipment

VEHICLE/VECTOR ATTRIBUTES

Machine/vehicle

- year
- make
- model
- condition
- insured/uninsured

Substances

- form
- location
- container
- amount
- interactions

People

- age
- height
- skill level

SOCIOECONOMIC/ PHYSICAL ENVIRONMENT

Time

Place

Weather conditions

Other conditions

Restricted to specific people

Unrestricted

Barriers in place

Other protective features

Parties liable for condition of environment

(7) Modify surfaces and basic structures

(8) Increase resistance to injury

(9) Provide adequate emergency response

(10) Provide medical care and rehabilitation

Haddon's countermeasures correspond to the three injury phases: countermeasures 1 through 3 apply to pre-event factors; 4 through 8 to event factors, and 9 and 10 to post-event factors. Table 7, following this page, provides examples of the 10 countermeasures as applied to injuries experienced by motor vehicle occupants, football players, and handgun victims.

(2) The Incompetence Reduction Approach

A useful analysis of factors in the pre-event phase was offered by Waller (1980). He observes that injury often results from a discrepancy between the demands of a certain task and the individual's capacity to perform. Thus injury is likely to occur under the following circumstances: (1) when a task is constantly demanding (auto-racing) or suddenly and unexpectedly demanding (driving through a blow-out); (2) when the performer suffers an unexpected reduction in ability (during a seizure); or (3) when minor reductions in performance coincide with minor increases in task demands (for example, when a mild lapse of attention coincides with ones changing lanes on a super-highway).

To develop countermeasures for the pre-event phase, ask two questions: (1) how can the individual's performance be maintained at levels equal to task demands and (2) how can task demands be maintained at achievable levels? For instance, individual performance may be maintained by restricting hazardous tasks to individuals capable of performing them. This countermeasure is central to the protection of toddlers, young children, and young people who often are ill-equipped to pursue activities they find tantalizing—climbing stairs for toddlers, cooking for young children, and driving for young adults.

Two measures for maintaining task demands at achievable levels involves human engineering:

- Simplify the task by making cues more visible and legible; do not require simultaneous attention to two or more cues.

- Position controls so that equipment cannot be activated inadvertently. These techniques are most applicable to complex, elective activities that involve equipment and may be influenced by environmental factors. Thus, the application to early childhood injury prevention is limited mainly to activities involving toys.

TABLE 7

EXAMPLES OF HADDON'S COUNTERMEASURES

STRATEGY	EXAMPLES		
	INJURY TO MOTOR VEHICLE OCCUPANTS	INJURY TO FOOTBALL PLAYERS	INJURY BY HANDGUNS
1. Preventing the marshalling of potentially injurious agents or 2. Reducing their amounts.	Alternative travel modes; reduction in speed limits and speed capabilities of cars.	Fewer games; shorter quarters; speed restrictions in tackling drills.	Reduced production of handguns and bullets.
3. Preventing inappropriate release of the agent.	Vehicle and road designs that simplify driver's task.	Playing surfaces that reduce likelihood of falls.	Locking up guns; eliminating motive for shooting (e.g., no cash).
4. Modifying release of the agent.	Use of seatbelts, to decelerate occupant with vehicle.	Short cleats on shoes allowing foot to rotate, rather than transmit sudden force to knee.	Single-shot guns requiring reloading between firings.
5. Separating in time or space or 6. With physical barriers.	Restricting transport of hazardous materials to certain times and places; highway medians.	Limited-contact practice drills; placing fixed structures further from field; face masks.	Bulletproof vests; bulletproof glass.
7. Modifying surfaces and basic structures.	Airbags to spread forces over wide area of body; removing projections in car.	Padding outside of helmets.	Soft, doughnut-shaped bullets for target shooting (require less initial velocity and unlikely to penetrate humans.
8. Increasing resistance to injury. 9. Emergency response or 10. Medical care and rehabilitation.	Therapy for osteoporosis. Systems that route patients in appropriately trained physicians.	Musculoskeletal conditioning. Personnel trained to recognize serious injuries, and physicians on call.	Occupational rehabilitation for paraplegics.

(3) The Ignorance Reduction Approach

Perhaps the most pervasive and simple conception of injury links occurrence, severity, and outcome to ignorance. In the pre-event phase, people get hurt because they do not appreciate the dangers around them. In the event phase, they lack the knowledge to reduce trauma severity. In the post-event phase they or those who try to help them respond inadequately or improperly.

"Ignorance reduction" approaches educate people about common and recurring hazards. For instance, pediatricians and family practitioners provide parents with "anticipatory guidance" to prepare them for the succession of risks that arise as a child develops.

Educational countermeasures may not suffice when emotional or motivational ambiguity is involved in human behavior. For instance, some activities may appeal to adolescents precisely **for** the dangers they present; education in these instances is quite beside the point. Therefore, it may be necessary to employ certain persuasion techniques to help people **appreciate** and avoid hazards.

In effect, when attempting to change behavior associated with injury, program planners must distinguish among three target groups: "the unaware," "the unconcerned," and "the passive," (i.e., people who do not act to protect themselves or their wards despite their awareness and concern). Table 8 describes potential countermeasures for all three target groups.

TABLE 8

TARGETS AND TECHNIQUES FOR HEALTH EDUCATION

TARGET GROUPS	POTENTIAL TECHNIQUE
The Unaware	Education effort to impart requisite knowledge
The Unconcerned	Emotional appeals to create concern
Aware and Concerned but Passive	Intervention aimed at specific block - Knowledge of what **can** be done - Knowledge of **how** to carry out action - **Ability** to carry out - **Belief** that action has substantive impact - Assurance gains outweigh sacrifices

In any sufficiently analyzed injury situation, a full range of countermeasures can be generated by employing the energy reduction approach, the incompetence reduction approach, and the ignorance reduction approach. The next step is to select countermeasures that appear most likely to prevent injury, reduce its severity, or improve the prognosis.

3. CONCEPTS AND ISSUES ASSOCIATED WITH ASSESSMENT OF COUNTERMEASURES

Before comparative assessments can be made, all countermeasures should be expressed in common terms. Accordingly, this ensuing text begins with a typology. It then concentrates on useful criteria for comparing the effectiveness, impact, and cost of various countermeasures.

(1) A Typology Of Countermeasures To Unintentional Injury

The two major types of countermeasures are active and passive:

- **Active countermeasures** require individual initiative and effort to ensure effectiveness. Active countermeasures can be simple, relying entirely on human action (like placing medicine out of reach). Or they can be complex, depending on a combination of human action and protective devices (like using childproof medicine containers).

- **Passive (automatic) countermeasures** do not require individual initiative or activity to ensure effectiveness; instead **engineering** provides protection by incorporating automatic safety features in furniture, toys, appliances, or vehicles or by removing environmental hazards—dangerous play equipment, concrete play surfaces, bushes obstructing vision, poorly located signs, and so forth.

When people fail to use demonstrably effective, active countermeasures to serious and frequent injury, then society eventually may override arguments of "personal choice and personal freedom" to mandate safe behavior or the use of protective devices. Examples include the mandated use of child restraints and motor cycle helmets. Similarly, if manufacterers, landlords, and governments fail to voluntarily eliminate recognized product or environment hazards, then society may require them to do so. For instance, the inclusion of safety springs on toy chest covers was mandated by law.

(2) Effectiveness Criteria

Potential effectiveness can be judged by assessing the likelihood that a countermeasure will be used and used correctly. Likelihood of use and correct use, in turn depend upon the necessary frequency of action and level of effort.

Passive countermeasures do not rely on individual effort and action and thus offer the best chance for effectiveness. The research community generally favors passive devices. Haddon notes that:

> ...adequate success through active approaches has been rare and requires exceptionally broad understanding and strong motivation on the part of those involved. In sharp contrast, passive approaches, **when available** and **once initiated** have a spectacularly more successful record. (Haddon, 1974)*

Haddon often uses the seat belt-airbag example to underscore the superiority of automatic devices. Seat belt effectivenss depends on billions of individual actions day after day. On the other hand, the universal provision of airbags depends on a one-time decision by a few Federal officials and automobile executives.

Passive countermeasures are preferable but, as hinted in Haddon's emphasized phrases, may be unavailable or difficult to initiate. For example, no passive alternative exists to the active countermeasure of constant surveillance of infants in the bath to prevent drowning. Similarly, active countermeasures, like promoting awareness of tap water scalds, may be essential precursors to laws mandating that water heaters be manufactured with lower maximum temperatures.

Active countermeasures vary widely in their potential effectiveness. Explore the following four questions to determine likelihood of use:

- **How often is action required?** Once only, as in turning down the thermostat on a domestic water heater to prevent scalding; every time protection is required, as in replacing the barrier to a stairway when a toddler is about; or continuously, as in monitoring a bathing toddler.

- **How much effort is required?** For instance, some childproof medicine bottles may be opened and closed with ease by reasonably able adults; other protective containers frustrate even the strong.

- **What other deterrents limit use?** Common deterrents to the protection of young children are cost, delay, discomfort, and sacrifice of pleasure, all of which have been associated with the use of car restraints. Loss of self or social esteem are additional deterrents to the protection of older children or adolescents, who may object to wearing motorcycle helmets on these accounts.

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* Emphasis supplied.

- **What incentives promote use?** Rules, regulations, and laws are the most common incentives beyond the basic but often unpersuasive desire to protect oneself and others. Thus the "rules of the game" may require that participants wear protective gear, city ordinances may require that landlords install protective bars on tenement windows, traffic laws may require that motorcyclists wear helmets, and insurance regulations may deny payment to households lacking smoke detectors.

For complex, active countermeasures a fifth questions must be added—how often is the protective device used correctly? For instance, little protection is provided by poorly designed car seats that are easy to misuse. Similarly, drawer locks must be installed correctly to be effective.

(3) Impact And Cost Criteria

As Haddon and Baker (1981) emphasize, "the popular statement 'It's worth it if it saves just one life' is dangerously false if the same resources used in a different way can save more than one life." Impact and cost are elemental considerations in assessing countermeasures.

In estimating the impact of proposed countermeasures, program planners must rely on their own critical reading of the literature. If considerable work has been done in the injury area of concern, it may be possible to estimate (in percentage terms) how much injuries would be reduced by successful implementation of the countermeasure. But if a certain local problem appears critical and if public support is sufficient, it may be appropriate to commit resources to a promising but untested approach.

In either case, it will be important to project both the cost of implementing the proposed countermeasure and the cost associated with an unchecked continuation of the injury trend in question. Table 9 lists major direct and indirect costs in injuries not prevented (Berger, 1981).

TABLE 9

COSTS OF INJURIES NOT PREVENTED

Direct Costs

Emergency services: Ambulance, emergency room, emergency medical technician, paramedic, physician, other personnel, blood bank

Hospital inpatient: Total cost—hospital services, physicians, surgical

Hospital outpatient department: All services, medications, appliances

Office-based physician

Disability and rehabilitation (includes medical care costs)

Rehabilitation: Physical therapy, occupational therapy, speech and hearing therapy (outpatient and inpatient)

Long-term care: Rehabilitation and custodial care

Home health care services: Home health care nurse, aide, and homemaker

Other Direct Costs

Administrative costs: Insurance, Medicare, Medicaid, Champus, state and federal disability, casualty insurance

Vehicle, barrier, and other property damage

Legal fees and court costs

Police costs

Welfare and other human service costs: Social worker, medical social worker, psychiatric social worker, administrative

Direct costs for other accident participants, observers (time in court, etc.), families of all participants

Morgue and medical examiner costs

Funeral costs

Indirect Costs

Earnings foregone due to death, injury disability

Consumption foregone due to reduced income

Value of time, production and consumption foregone by family during care of the accident victim, or reduced earnings due to early termination of education or training

PART A

PLANNING THE PROGRAM

State Title V agencies are a natural locus of injury prevention activities for children. In its leadership capacity, a State Title V agency is responsible for needs assessment, resource development, standard setting, quality assurance, advocacy, and professional consultation related to health care of mothers and children. Since accidental injury is a major cause of childhood morbidity and mortality, it is logical that State Title V agencies encompass the development of programs and services to reduce preventable injuries.

Title V agencies also can coordinate development of child-related programs in other State agencies concerned with injury control (e.g., Transportation, Environmental Control) and can support existing programs sponsored by such agencies. Moreover, with the Maternal and Child Health Block grant, States now have increased flexibility to initiate and fund these programs directly.

This part of the Manual outlines the steps required to develop injury prevention programs:

- **Chapter III: Assessing The Need In Your State: Collecting And Analyzing Epidemiological Data**—This Chapter outlines an epidemiological approach to needs assessment and provider information about data sources as well as some procedures for developing new data bases.

- **Chapter IV: Getting Started: Initial Program Planning**—This Chapter discusses developing support for the program, setting goals and objectives, and obtaining resources.

CHAPTER THREE

III. ASSESSING STATE NEED BY COLLECTING AND ANALYZING EPIDEMIOLOGICAL DATA

Conducting an epidemiological study is the most productive first step in developing a childhood injury prevention program because the resulting data provide program decision makers with the tools for building all subsequent program activities. Without an understanding of the injury problem, the program might waste its time and limited resources in misdirected efforts. Epidemiological study objectives are to identify and measure:

- **Problematic Injuries** by revealing which injuries occur most frequently and their relative severity. This information provides a basis for selecting **target injuries.**

- **Populations At Risk** by revealing which population subgroups within the State disproportionately experience target injuries. This information provides a basis for selecting **target populations.**

- **Injury Causes** by revealing what combination of circumstances consistently contributes to target injuries in target populations. This information provides a basis for selecting the **prevention strategy** and **intervention designs.**

Meeting these objectives not only assists the program in targeting the effort and designing the strategy, but also can help justify requests for resources and support and guide allocation of resources.

A program has three options for collecting needed epidemiological data: (1) using existing data bases; (2) developing new data bases; and (3) combining existing data and new data. Carefully weigh the relative advantages of each option in terms of data adequacy, collection staff requirements and costs.

Federal and State agencies and various other organizations have developed **existing data bases** containing much useful injury information. Thus, discovering and accessing these data should be the first study activity. Using existing data is less expensive and time-consuming than collecting new data but has several potential disadvantages. Data bases may be unavailable for all injuries of interest or contain incomplete data (injury cause is often missing). Data may not cover the appropriate geographic area.* Data quality may be uneven. And if the data are not in the desired format, data manipulation may be difficult and expensive.

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* Synthetic estimation techniques can be applied to impute local or State estimates from national data. This involves applying national or regional estimates for specific population subgroups (e.g., age, race, sex) to similar population subgroups in local areas (Schaible et al. 1979; Levy and French 1977; NIDA 1979).

Developing new data bases ensures that desired information will be obtained for the appropriate geographic area. Data quality and data base format can be controlled tightly. On the other hand, collecting new data is extremly expensive and time-consuming. Moreover, it is technically and politically complicated.

Combining **existing data with new data** is a third option. Existing data, even if incomplete, can serve as a point of departure. Existing data can be used to make initial decisions about where to collect new data—to narrow the range of initial inquiry. Then collection of new, more detailed data can be limited to specific target populations, injuries, and causes. The advantages and disadvantages of the two previous options apply here as well.

Before embarking on a data collection effort, clearly understand what information is essential, define specific objectives for the effort and limit the extent of data collection.

This chapter further describes what an epidemiological study is, discusses data sources and provides examples of existing data bases, explains how to develop new data bases, and describes how to interpret data.

1. UNDERSTANDING EPIDEMIOLOGICAL DATA

In an epidemiological study focused on childhood accidents, data are collected within a defined population to reveal problem injuries, at risk populations, and injury causes. These data are obtained first about individual cases. Individual case data are then aggregated and analyzed to produce population-based estimates.

Data elements used in such a study are ones that describe and explain injuries. Specifically, they describe:

- **Who** was injured
- **What** was the nature of the injury
- **When** the injury occurred
- **Where** the injury occurred

By analyzing descriptive data, epidemiologists discover unusual, problematic injury patterns. For example, epidemiological data reveal whether certain injuries occur most often to particular population subgroups, more frequently at specific locations, or usually during one time of day or season.

Other epidemiological data elements explain injury problems by determining:

- **How** the injury occurred
- **Why** the injury occurred

For example, epidemiological data reveal whether certain injuries happen continually in a predictable sequence and whether similar circumstances repeatedly contribute to injuries.

(1) Who—Child And Family Characteristics

First, epidemiological data describe demographic and socio-economic characteristics of injured children and their families. Child descriptors include age, sex, race, and medical conditions (e.g., acute or chronic illness, mental or physical handicap). Family descriptors include household income, family size and composition, and education levels. Descriptive data also may include place of residence or payment source for medical treatment; these are surrogate measures for socio-economic status. This information reveals whether one population segment is at a higher risk for a particular injury than the whole population. For example, such data would show if 10-year-old boys from low income households have a higher burn injury rate than 10-year-old boys from high income households.

(2) What—Injury Result And Nature

Second, epidemiological data describe the injury resulting from the traumatic event. Treatment-related variables can be used to characterize injury result: these variables parallel the data sources.* Variable categories, describing injuries from least to most serious, are:

- Treated at home
- Treated by physician
- Treated and released from emergency department
- Admitted to hospital
- Died

Injuries requiring hospital treatment (the last three categories) can be classified, usually by nature and sometimes by cause. The primary classification scheme is the International Classification of Disease (ICD) (NCHS 1980). Developed by the World Health Organization, these classifications are widely used for statistical purposes and to index hospital records by disease and procedure. The most recent (ninth) ICD edition (ICD-9-CM) is particularly useful in classifying injuries. The applicable portions of the ICD-9-CM are:

- A catalogue listing diseases and injuries by diagnosis. Each diagnosis has a unique three- to five-digit numeric or alphanumeric code. These codes are known as N-codes, N referring to the nature of the injury. Injury and poisoning codes appear between 800 and 999. For instance, 800 is the code for fracture of vault of skull and 960 is the code for poisoning by antibiotics.

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* Two further refinements can add to the understanding of injury result, but are not required to develop injury prevention programs. With medical advances and improvements in emergency medical systems, long term injury results assume increasing importance; collecting data about recovery, residual impairment, and disability can complete the epidemiological picture. A second interesting concept is the near event—an accident that did not result in an injury (e.g., when a child is saved from drowning)—but data about near events is difficult to collect.

- A supplementary section listing external causes of injury and poisoning. These are known as E-codes. (E-codes are explained further on page 48.)

- A procedure catalogue listing codes for therapeutic and diagnostic procedures.

ICD code use varies by hospital. The Massachusetts project found few hospitals routinely coded injuries that did not result in death. Some hospitals N-coded admissions data; none N- or E-coded emergency room data. This situation may differ in other parts of the country.

If desired, the injury description can be refined further using the Abbreviated Injury Scale (AIS) to rate trauma severity (excluding poisoning). The AIS was developed by the Joint Committee of the American Association for Automative Medicine (AAAM) and the Society of Automotive Engineers (SAE) (AAAM 1980). It rates individual injuries on a scale ranging from one (minor injury) to six (maximum injury—virtually unsurvivable). The combined effect of multiple AIS-coded injuries can be assessed by using the Injury Severity Score (ISS) (Baker et al. 1974). AIS coding can be time-consuming, taking between 10 and 30 minutes per inpatient chart depending on the clinical experience of the trained coder (MacKenzie and Shapiro 1983). A computer program is now available, however, that reduces coding time by converting commonly used ICD-9-CM injury codes into AIS codes (MacKenzie and Garthe 1983).

(3) When—Date And Time Of Injury

Knowing the injury date and time helps predict injury patterns. Some injuries occur primarily in the summer (drowning), others in the winter (wood stove burns). Younger children may be burned or poisoned around mealtime, when parents are busy. Older children may suffer bicycle injuries in the late afternoon when school ends. Poor weather contributes to injuries; for example, auto accidents increase on rainy days.

(4) Where—Location Where Injury Occurred

Injuries happen in the home, at school, in recreation areas, on the street, and elsewhere. Knowing where the injury occurred helps determine where interventions might be implemented. For example, identifying particular streets where bicycle injuries often occur can lead to interventions that mark or regulate that location; knowing where drownings occur most often can help discover communities with inadequate swimming pool regulation and lead to strategies for reducing the hazards.

(5) How—External Injury Cause

Understanding how the injury happened is a critical part of the epidemiology study. Three types of data describe the injury cause:

- The underlying event—e.g., an auto accident

- The mechanism—e.g., child hits windshield

- The etiologic agent—e.g., mechanical energy transfered when vehicle hits tree

As noted, the ICD system includes a supplementary coding set called E-codes that classify external injury cause. E-codes permit classification of environmental events, circumstances, and conditions as the cause of injury or poisonings. Example E-codes include: E861.1, Accidental poisoning by soap products; E884.0, Fall from playground equipment; and E893.0, Accident caused by ignition of clothing from controlled fire in private dwelling. When used in tandem, N-codes and E-codes characterize the nature and cause of the injury. For instance, E-codes reveal whether a skull fracture was caused by a fall from a bicycle, a fall downstairs or a motor vehicle accident. Without E-codes, N-codes are less useful. Unfortunately, E-codes are used on a limited basis and they suffer three deficiencies: they do not identify the etiologic agent, they often do not indicate the injury mechanism, and they do not distinquish sports injures.

(6) Why—Environmental Contributors

Environmental factors contribute to many injuries; knowing what role these factors played can suggest corrective interventions. For example, children often are injured in motor vehicle accidents because they were not wearing seat belts or placed in car seats. Poisonings may occur because poisons are stored within childrens' reach. Burns may occur because matches are left on coffee tables.

2. SOURCES OF EPIDEMIOLOGICAL DATA

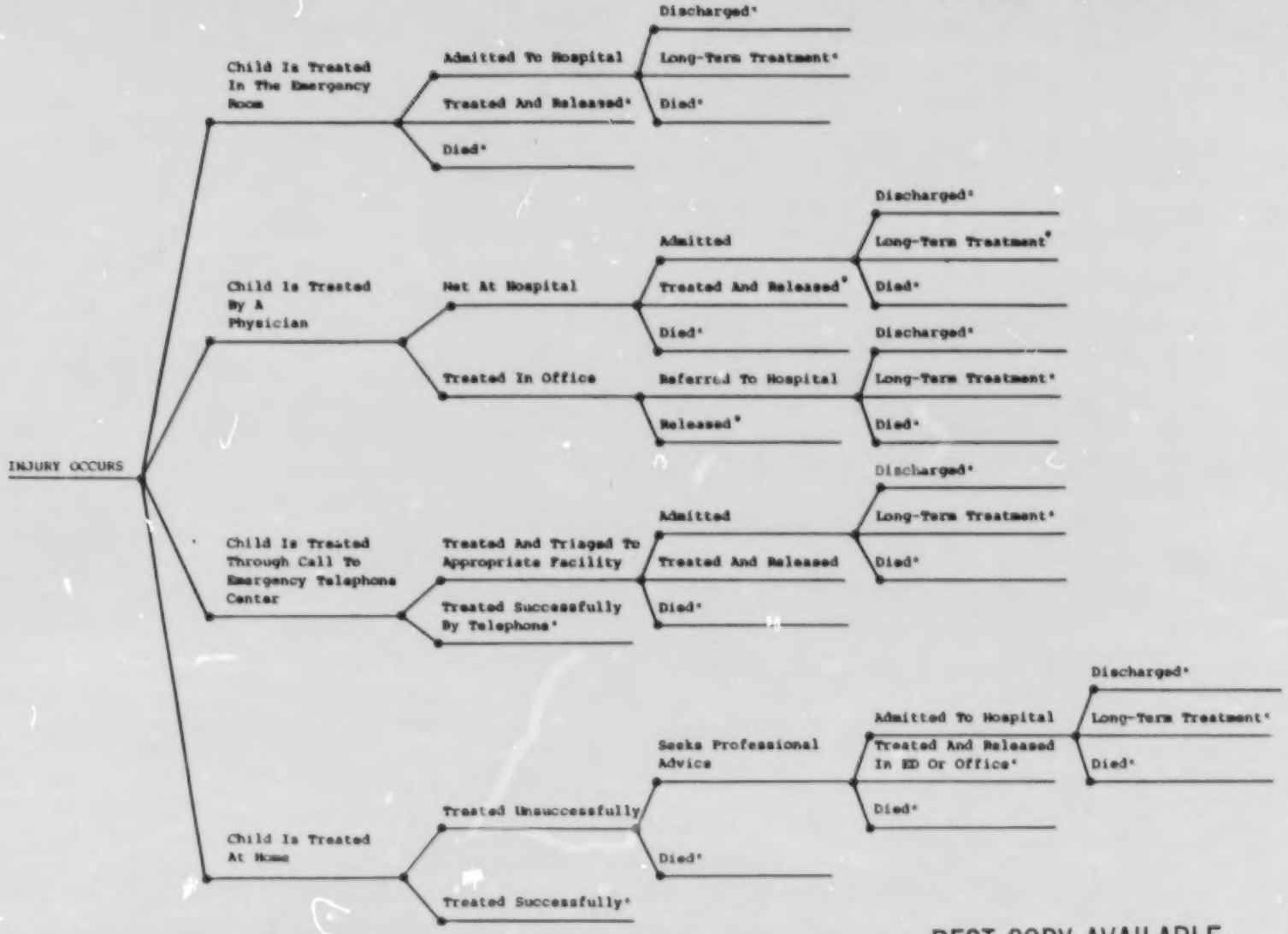
Epidemiological data can be collected from individuals and health care organizations with which injured children come in contact. These data sources can be categorized using the same variables that describe injury result: treated at **home** (e.g., parents, caretakers); treated by a **physician**; treated and released in the **emergency department**; admitted to the **hospital**; and died (**hospital** and **government**). Figure 4 suggests the complex paths through which injured children reach the final injury result. The pyramid in Figure 5 illustrates the distribution of injured children by injury result. As the pyramid broadens, both injury severity and availability of existing data decrease.

In addition to treatment-related data, demographic and socioeconomic data are necessary to provide denominators for population-based estimates. These data generally are available from government organizations.

Thoroughly explore the possibility that someone has already collected epidemiological data from these sources, before considering collecting it firsthand. Many Federal, State, and local data bases already exist for certain injuries or injury results. The next several paragraphs describe what data typically can be found in various sources and how they can be used. Table 10 lists sources and existing data bases described in the text.

FIGURE 4

CHILDHOOD INJURY TREATMENT DIAGRAM



* Points of data capture necessary to construct a complete epidemiological data base.

BEST COPY AVAILABLE

FIGURE 5

DISTRIBUTION OF INJURED CHILDREN
BY INJURY RESULT

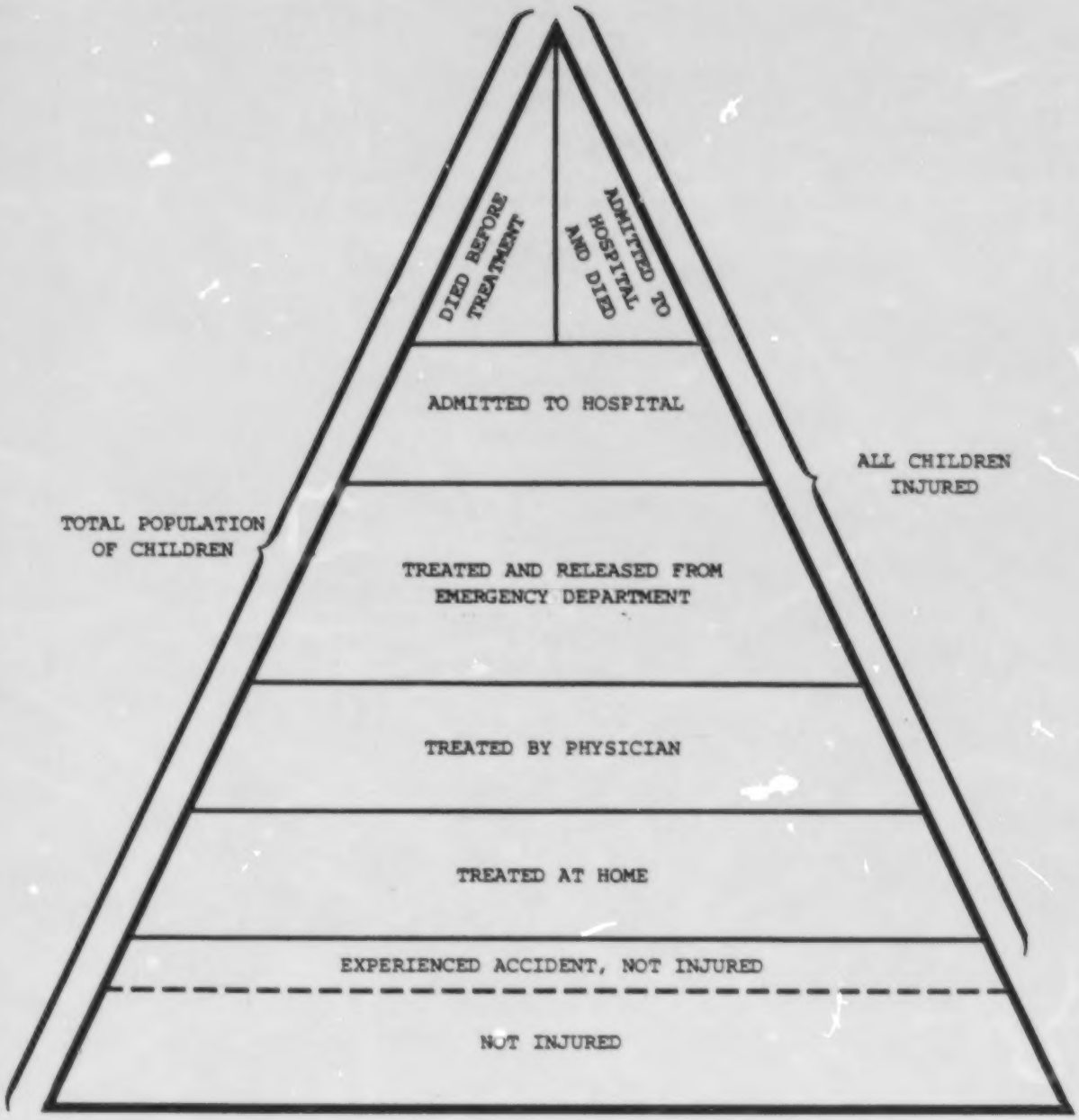


TABLE 10

EXAMPLES OF DATA AND SOURCES NEEDED FOR AN EPIDEMIOLOGICAL STUDY

TYPE OF DATA	POSSIBLE SOURCES
Death	Computerized Hospital File Vital Statistics (Death Certificate) Coroner's Report Police Records Fire Department Reports
Hospital Admission	Hospital Computerized Files Inpatient Medical Records Hospital Data Abstract Services Household Surveys Special Studies And Publications Registries And Clearinghouses
Emergency Department Treatment	Emergency Department Encounter Sheets Household Surveys Special Studies And Publications Registries And Clearinghouses
Physician Treatment	Physician Surveys Household Surveys Special Studies And Publications
Home Treatment	Household Surveys Poison Control Center Logs Special Studies And Publications
Demographic/Socioeconomic	Census Data Health Planning Agency State Research Bureaus

(1) Mortality (Death) Data

Since registration of deaths is required in all States, mortality data are relatively easy to obtain from death certificates. Most State death certificates resemble the United States Standard Death Certificate developed by the National Center for Health Statistics. This form contains the immediate and underlying causes of death, name, sex, date, place of birth, nationality, last residence, last occupation, marital status, parents' name, and date and place of death. If death was accidental, the certificate includes the injury date and place and describes how the injury occurred.

Local and State agencies responsible for maintaining death records usually publish basic tabulations and death rates. In addition, the National Center for Health Statistics publishes detailed mortality reports for the Nation and for individual States.

Mortality data, however, provide only limited descriptions of injury nature, severity, and circumstances. Use caution in interpreting the recorded "immediate" and "underlying" causes of death on the certificate. When more detailed mortality data are needed, link death certificates to other documents such as Coroner's reports, police department reports, and hospital files.

(2) Hospital Admission And Emergency Department Data

Hospital data generally provide accurate information about injuries serious enough to require hospital admission or treatment in the emergency department. Hospital data alone, however, produce conservative morbidity measures because they underestimate the incidence of (1) minor injuries and (2) severe injuries that result in death before treatment can be rendered. Further, emergency department data over-represent populations that routinely receive care in this setting and under-represent populations that have established relationships with private physicians.

Look for hospital abstract services that collect data from hospitals throughout the State. Data from these services have two disadvantages: a six-month lag time in abstracting cases and lack of E-codes.

National hospital inpatient data are available from the National Hospital Discharge Survey (NHDS). Conducted since 1970 by the National Center for Health Statistics, NHDS is a continuous nationwide survey of inpatient utilization of short-stay hospitals (NCHS, 1970). The 1979 survey abstracted data from 215,000 medical records selected randomly from 431 hospitals. Data are collected from hospital record face sheets and include: age, race, sex, marital status, source of payment, discharge status, length of stay, up to five diagnosis codes, and three surgical procedure codes. Diagnoses and surgical procedures are coded using ICD-9. E-codes as well as N-codes are included if reported by hospitals. This survey provides reasonably accurate hospital discharge rates for certain classes of injuries by age, race, and sex, and by State. To obtain copies, contact: National Center for Health Statistics, Department of Health and Human Services, 3700 East-West Highway, Center Building, Room 243, Hyattsville, Maryland 20782, (301) 436-7125.

(3) Physicians

Data obtained from primary care physicians in ambulatory care settings add knowledge about injuries severe enough to require physician attention but not hospital care. Physician surveys also can determine the extent of physicians' injury prevention knowledge and practice.

The National Ambulatory Medical Care Survey (NAMCS), also conducted by the National Center for Health Statistics, collects information from a nationwide representative sample of medical doctors and doctors of osteopathy (NCHS 1974). In 1979, 1,783 physicians participated in the NAMCS providing data on a random sample of 45,351 office visits. Data collected for each sample visit include date; patient age, race, and sex; up to three principal medical problems; major reason for the visit; up to three principal diagnoses; diagnostic and therapeutic services provided; and case disposition. To obtain copies contact: National Center for Health Statistics, Department of Health and Human Services, 3700 East-West Highway, Center Building, Room 243, Hyattsville, Maryland 20782, (301) 436-7132.

(4) Emergency Response Systems

Emergency response systems, such as poison control centers, ambulance services, and paramedic services can provide additional data about injuries. For example, the National Clearinghouse for Poison Control Centers (Food and Drug Administration) collects data from 75 percent of all poison control centers and publishes an annual report for the Nation, for individual States, and for each poison control center. The annual report covers poisonous substances, all cases, toxic cases, signs and symptoms, severity index, hospital visits and fatalities, and victim age and sex. Special reports can be produced upon request. To request reports contact: National Clearinghouse for Poison Control Centers, Food and Drug Administration, Department of Health and Human Services, 5600 Fishers Lane, Room 18B-33, Rockville, Maryland 20857, (301) 443-6260.

(5) Households

Data obtained from household surveys can complete the epidemiological picture by providing:

- Parental knowledge about and attitudes towards injury prevention
- Information about the circumstances of traumatic events
- Reasonably accurate estimates of injury incidence, whether minor or severe, including those treated at home

The Health Interview Survey (HIS) collects nationwide data from a random sample of the civilian, non-institutionalized population (NCHS, 1975). The interview instrument contains: (1) core demographic, health status, and utilization questions whose content varies little from year to year; (2) rotating items that appear at intervals from two to five years; and (3) supplements that are included only once (e.g., health insurance, health habits,

usual sources of care). During a one-year period, interviews are conducted in about 41,000 eligible households, yielding a national probability sample of about 120,000 individuals. This sample design and size is sufficient to support reliable estimates for the Nation as a whole, for four broad geographic areas, and for certain Standard Metropolitan Statistical Areas (SMSAs). The HIS provides limited but valuable information on self-reported injuries that required medical attention or resulted in one or more days of restricted activity. To obtain copies contact: National Center for Health Statistics, 3700 East-West Highway, Center Building, Room 244, Hyattsville, Maryland 20782, (301) 436-7089.

(6) Registries And Clearinghouses

Several States and regions maintain ongoing registries for information about certain illnesses and injuries. For instance, Massachusetts has a mandatory reporting system for all burns that involve five percent or more of body surface.

The Consumer Product Safety Commission's National Injury Information Clearinghouse maintains the National Electronic Injury Surveillance System (NEISS). This system collects data on injuries associated with consumer products. Data are collected from 73 hospital emergency departments nationwide. Summaries are available in two regular publications, Tabulation of Data from NEISS and NEISS Data Highlights. Data are most commonly grouped by product code and include diagnosis, body part, age group, and case disposition. Other CPSC databases contain information on consumer complaints, product-related deaths, and in-depth investigations of certain accidental injuries. To request injury information, write or call National Injury Information Clearinghouse, U.S. Consumer Product Safety Commission, 5401 Westbard Avenue, Room 625, Washington, D.C. 20207, (301) 492-6424.

(7) Special Studies And Publications

Large-scale data collection efforts on the State, regional, or local level can be valuable sources of information. The San Diego CNS Injury Project, for example, collected data on all persons up to age 20 who sustained a fatal head injury or were hospitalized for a head injury during 1978. The federally-sponsored Burn Demonstration Program collected two years of burn incidence data in six regions. Professional journals and other publications may contain injury data. For example, the National Safety Council (NSC) compiles information on the number and circumstances of traumatic events. Annually, NSC publishes Accident Facts, a compendium of statistics the United States and for selected cities. For a copy, write to National Safety Council, 444 N. Michigan Avenue, Chicago, Illinois 60611.

(8) Demographic And Socioeconomic Data

Demographic and socioeconomic data about the whole population are needed to compute denominators for epidemiological rates. This is available from Federal census data, State and local government research bureaus, and patient origin studies conducted by hospitals or health planning agencies.

3. DEVELOPING NEW DATA BASES

If information needed to plan an injury prevention program is not available from existing sources, consider developing new data bases. Designing and implementing an epidemiologic data collection effort is a costly and time consuming endeavor that should be undertaken only if there is no possibility of satisfying needs with existing data bases.

If such an effort is decided upon, professional consultation by an epidemiologist is highly advisable. The material in this section is designed as an overview only, not as detailed instructions. It describes three data collection approaches; a hospital medical records survey, a household survey, and a physician survey. For each approach, the steps involved in planning and implementing the data collection effort are presented as if they are strictly sequential. In fact, design, content, and implementation must be considered simultaneously because each affects the other.

(1) Surveying Hospital Medical Records

Hospital medical records provide data about injured children who were admitted or cared for in the emergency department. By surveying a hospital or hospitals with clearly defined catchment area, population based data can be developed.

Casefinding can be done through use of computerized files or through a review of emergency department logs or records. Some hospitals have computerized files of inpatient admissions from which data on specific injury can be retrieved rapidly. Fewer hospitals have computerized files on ambulatory care encounters. Computerized hospital record systems generally include such information as: admitting and discharge diagnoses; patient age, race and sex; length of stay; diagnostic and therapeutic procedures; and disposition at discharge. Diagnoses and procedures may be ICD-coded. When information is desired about a particular class of accident and files are not E-coded, however, it may be difficult to obtain sufficient detail for case-finding through computerized searches.

If a computerized file system is not available, emergency department log sheets can be used to identify a sample of admitted patients. If log sheets do not contain sufficient identifying information, reviewing the whole ED record might be necessary.

Directly **abstracting medical records** provides the opportunity to collect more detailed data and to evaluate the quality of medical record data. Table 11 shows data commonly available from inpatient and emergency department medical records. Records vary in completeness, organization, and legibility, and these variables affect the time and resources required to prepare abstracts. In some instances, face sheets or discharge summary sheets provide sufficient information about the underlying event, diagnosis, and disposition upon discharge. In many cases, records are not E-coded and the entire record must be reviewed to see if the diagnosis is injury-related. The whole record also should be reviewed when detailed information is needed about injury nature, severity, and treatment.

TABLE 11

DATA RETRIEVABLE FROM MEDICAL RECORDS

SOCIO-DEMOGRAPHIC

- Age/Race/Sex Of Patient
- Zip Code Of Residence
- Source Of Payment

CONTACT WITH HEALTH CARE SYSTEM

- Dates Of Admission And Discharge
- Mode Of Arrival*
- Admission Status

CHARACTERISTICS OF THE INJURY

- Place Of Injury
- Underlying Event Causing Injury*
- Contributing Cause* (Alcohol/Drug Involvement; Acute Or Chronic Illness; Mental Or Physical Handicap)
- Diagnosis
- Severity (Anatomic And/Or Physiologic)

TREATMENT

- Medical And Surgical Procedures
- Medications

SHORT-TERM OUTCOMES

- Length Of Stay In Facility
- Length Of Stay In ICU
- Disposition At Discharge

* May not be available if treated and released in emergency room.

If a medical records survey is indicated, consider narrowing its scope to a limited geographic area and a few injuries. Conducting a medical records survey is complicated politically and technically. If the program decides to undertake this survey, the general steps described below will be needed. Remember, this is much simpler in description than in execution.

STEP 1: Identify Hospitals That Serve The Geographic Area Of Interest.

STEP 2: Specify Data Elements—Be parsimonious; include only items for which reliable and useful data are available in the medical record.

STEP 3: Design The Data Collection Form—Pre-code and condense the form as much as possible without sacrificing legibility.

STEP 4: Pre-Test The Instrument Using A Representative Sample Of Charts; Revise As Indicated.

STEP 5: Determine Sampling Plan—Depending on the number and type of hospitals in the universe, decide whether to identify cases in all hospitals or a sample of hospitals only. Similarly, decide whether to abstract all cases or a sample of cases in each hospital. It may be possible to abstract all inpatient admissions, but, because of volume, it typically will be necessary to sample ED cases. For example, the Massachusetts project collected 100 percent of admissions and 25 percent of emergency department visits. The ED visits were sampled by collecting data for a five day period every 15 days.

Professional statistical help should be used in developing the sampling plan to ensure representativeness and validity of the sample. Seasonal and other temporal variations in accrual of certain injuries (e.g., drowning) should be considered.

STEP 6: Contact Hospitals—Obtaining hospital cooperation requires diplomacy and patience. Obtaining approval of the institutional review board can take up to six months. Experience suggests this approach:

- Send a letter to the hospital administrator, chief of pediatrics, or other appropriate person. Outline study objectives clearly, describe the data collection process and scope, and explain how data will be used. Explain how confidentiality will be protected. Emphasize that data will be published in aggregate form only and that individual hospitals will not be identified.

- Next, call the hospital contact to schedule a meeting with key people. The chief of pediatrics has the greatest leverage, so concentrate efforts there.

- In both the initial letter and follow-up telephone call, offer the hospital something in exchange for participation. The hospital decisionmakers may be more interested if they are promised a detailed report of hospital data, can include an additional item of particular interest on the data collection form, or receive a report comparing their hospital to others.

- Ask the medical records coordinator to help determine the most efficient way to identify appropriate charts and retrieve records.

STEP 7: Collect The Data—During the data collection phase, remember these tips:

- Arrange work so it creates a minimum disruption to the medical records department daily activities.
- Train and provide data abstractors and give them detailed written instructions for retrieving and coding each data item.
- Enlist support of people with professional stature who can help convince hospitals to participate in the study.
- Meet with staff periodically to resolve coding problems and monitor case identification procedures.
- Implement a quality control system to ensure uniform case-finding and abstracting procedures and to estimate under reporting.
- Record the total number of encounters or admissions to obtain the size of the universe.

STEP 8: Edit And Tabulate The Data—After collecting data, perform initial edits and tabulations:

- Check abstracts for completeness.
- If a computer is to be used for data analysis, enter data and perform machine edits.
- Produce frequency distributions of all variables and examine for patterns.
- Calculate encounter and admission rates if the sample hospitals catchment areas are sufficiently well defined. Take into account: sampling ratios; number of unlocated records; and age, race, sex, and other charactristics of the service area population.

STEP 9: Provide Feedback—Share results with appropriate hospital staff, along the way and when data collection is complete. This ensures future cooperation and may encourage the hospital to develop injury prevention programs.

(2) Conducting Household Surveys

Household surveys afford an opportunity to collect population-based data on minor injuries, injury circumstances, and knowledge about prevention. Household surveys should be designed to ensure representation from geographic subareas and minority populations. Alternatively, a household survey may be conducted in a closed setting, such as a clinic, if the patient population is representative of a pre-selected target audience.

Household surveys can be very time-consuming and expensive, especially if conducted by face-to-face interviews. Telephone surveys are less expensive. The cost of designing and pre-testing the survey can be reduced by using all or part of an existing instrument, such as questionnaires designed by MCH demonstration projects and National Health Interview Survey. Using standard survey instruments also allows comparisons among populations and over time. Be sure to enlist an experienced firm to design and implement the survey.

The nine steps below outline the process of designing and implementing a household survey.

STEP 1: Define The Target Population—Determine the criteria (e.g., parents of children under five, place of residence) by which individuals will be identified as members of the target population.

STEP 2: Outline The Survey Scope—Define the major topics of interest:

- Household demographics and socioeconomic characteristics
- Prevention knowledge and attitudes
- Injury occurrences
- Primary and contributing injury causes
- Circumstances surrounding the injury
- Care received
- Injury outcome

STEP 3: Determine The Method Of Administration—Decide whether survey information will be collected in person or by telephone. Telephone surveys are as reliable as face-to-face interviews for most items (Cannel, 1978). About 95 percent of the US population now has telephones, although the extent of telephone coverage varies by geographic region (e.g., urban versus rural) and by socioeconomic status. Local telephone company offices may be able to provide this information.

A significant portion of every population has unlisted numbers. Using the random-digit dialing technique to select households overcomes this problem and also provides a probability sample of the target population (Waksberg, 1978).

STEP 4: Identify Individual Data Elements And Specific Questions—Determine length, content, and order of interview questions. The number of questions usually is limited by the time people are willing to be interviewed—a one hour face-to-face interview is practical, but a telephone interview should rarely exceed 30 minutes.

Experienced questionnaire designers use these techniques:

- Incorporate items successfully included in prior surveys to reduce costs, increase reliability, and provide a basis of comparison with other populations.

- Design straightforward questions not subject to several different interpretations. Choose words carefully, with an eye to whether the survey will be administered in person or by telephone.

- Choose a realistic recall period, i.e., the length of time in the past that respondents are expected to remember injury incidents. A long period will cover more incidents, but memory is most clear about recent events. Trade off the benefits of a long recall period (identifying sufficient incidents) with the benefit of a short period (accurate memories).

- Consider using response cards for multiple choice questions if the survey is administered in person; doing so can increase reliability. If the survey is to be administered by telephone, the utility of sending response cards prior to the phone call is questionable (Durako and McKenna, 1980).

- Put sensitive questions toward the end to lower the risk of early termination.

STEP 5: Determine Sample Size And Design—Select a probability sample that reflects the target population composition. The sample size will be determined by: (1) resources available, (2) the desired accuracy (confidence) level, (3) whether estimates are needed for geographic subareas and population subgroups, and (4) whether survey data will be used for baseline evaluation. Again, make certain expert advice is sought in sampling design.

STEP 6: Collect Data—Determine whether to conduct the survey in-house or under contract. In most cases, contracting with a survey research firm will be cost efficient. State agency personnel rarely have the time or expertise to conduct the survey in-house. Regardless of whether State or contractor staff conduct survey, maintain close contact throughout the data collection period to ensure data quality and consistency. Data collection tips include:

- Train interviewers properly and provide them a manual of general guidelines and detailed instructions.

- Pre-test the instrument under realistic conditions. Debrief interviewers following the pre-test and make necessary changes to the instrument or interview procedures.

- Contact each eligible household several times before registering it as a non-response. Distribute attempts over evening, weekend, and daytime hours.

- Recontact all respondents who initially refuse; use a different, more experienced interviewer to try to change their minds before recording them as refusals.

- Conduct interviews from a central location to permit close monitoring of interviewer performance.

STEP 7: Determine Survey Bias—Compare respondents with non-respondents to see if the two groups differ in significant ways that affect survey validity.

STEP 8: Edit And Code Data—Edit data for incomplete and inconsistent responses immediately after each interview. Encourage timely corrections and coding. If a computer will be used for analysis, use machine edits to check for range and logic errors.

STEP 9: Derive Estimates Of Knowledge, Attitudes Behaviors And Injury Incidence—Adjust survey data to the whole target area population taking into account: probability of household selection; non-response rate; and the age, race, and sex distribution.

(3) Conducting A Physician Mail Survey

Although not a high priority for most epidemiological studies, a physician mail survey can collect accurate incidence estimates and detailed information about injury nature and cause. Obtaining cooperation may be difficult. If the program decides to go ahead these steps are recommended.

STEP 1: Define The Universe Of Physicians To Be Surveyed—Identify all physicians who practice in solo, group, or clinic settings. The State Board of Medical Examiner licensure file is a good source of names.

STEP 2: Determine The Sample Size And Design—The extent and method of sampling depend on: (1) study objectives, (2) desired accuracy (confidence) level, and (3) resources available. A stratified sample in which pediatricians and family practitioners are separated from other primary care physicians is appropriate for studying childhood injuries.

STEP 3: Design The Survey Instrument—Include a short questionnaire, a patient encounter log, and an abstract form for a sample of visits. The National Ambulatory Medical Care Survey (NAMCS) can serve as a prototype.

STEP 4: Collect Data—Ensure a high response rate by taking these steps:

- Notify private physicians about the survey through local medical society newsletters and mass media.

- Send an introductory letter to all selected physicians explaining study objectives and asking for cooperation. The letter should be co-signed by the President of the Medical Society or specialty society, or by another local medical community leader.

- Offer physicians something in exchange for cooperation, such as a copy of the final report and incorporation of additional items of interest into the survey.

- Mail the survey with a pre-paid return envelope.

- Send a diplomatic reminder.

- Follow-up with one or two telephone calls. Make every attempt to obtain at least a completed physician questionnaire. Try completing the most important questions over the phone.

STEP 5: Determine Survey Bias—Compare respondents with non-respondents by conducting brief telephone conversations with non-respondents and by reviewing Medical Society directories.

STEP 6: Process And Edit Data—Review survey forms as they are returned so that timely clarifications can be made via telephone or mail. Then, survey data should be coded and manually edited; if automation is to be used, enter data and perform machine edits.

4. EPIDEMIOLOGICAL DATA USES

Epidemiological data can be used for two purposes.

First, they can produce injury rates for the whole target population and subgroups; this permits comparisons, in turn, between target subgroups and similar subgroups in outside populations to identify groups that are at high-risk for particular injuries. Three commonly used rates are described below.

- **Incidence rates** express the frequency of injury occurrence.

- **Death rates** provide a probability of dying from an injury.

- **Case Fatality rates** measure the injury "lethality", i.e., the number of people who die from an injury expressed as a percentage of the people sustaining that injury.

Second, epidemiolgical data can be used to analyze the circumstances of target injuries for high-risk populations. These data can be analyzed by employed the concepts described in Chapter II. The Haddon matrix (page 33) is particularly useful in understanding injury causes and providing clues about effective prevention strategies.

The tables and figures below provide examples of epidemiological data analyzed in various ways. The examples are drawn from the three demonstration project epidemiological studies.

- **Narrative Presentation**—The Data Collection Face Sheet, shown in Table 12 highlights findings of the California project epidemiology study. Data from the household survey, poison center logs, hospital medical records, and two existing databases are combined to describe poisons, burns, and head injuries.

TABLE 12(1)

NARRATIVE PRESENTATION CALIFORNIA PROJECT

CHILDHOOD ACCIDENT PREVENTION PROJECT

DATA COLLECTION FACT SHEET

POISONINGS

Household Survey: (data base was 1,213 families with children ages 0 through 14 years)

-----68% of these families did not have ipecac in the home; an additional 3% did not know what it was

-----83% of the cases were in 0 through 3 year-olds

-----Mother was the caretaker in 86% of the cases

-----Incident took place in the kitchen or bathroom 48% of the time

-----Aspirin products, cough and cold preparations, and other drugs accounted for 35% of the poisonings; household products and cleansers accounted for another 13%

Poison Center Data: (data base was all ages)

-----58% of cases were in 0 through 3 year-olds

-----Aspirin products, cough and cold preparations, and other drugs accounted for 33.3% of the poisonings; household products and cleansers accounted for another 43.1% in 0 through 3 year-olds

Hospital Data: (data base was 0 through 14 years)

-----72% of all cases were in 0 through 3 year-olds

-----Aspirin products, cough and cold preparations, and other drugs accounted for 58% of all cases; household products and cleansers accounted for another 7%

TABLE 12(2)

BURNS

Household Survey:

-----68% of burn cases in 0 through 14 year-olds occurred in children ages 0 through 3 years

-----41% of burns in 0 through 14 year-olds were due to contact with a hot surface; 37% were due to hot liquid scalds

-----Mother was the caretaker in 84.9% of the incidents

-----Child was burned in his home in 53% of the cases

Regional Burn Project Data: (data base was 0 through 3 year-olds)

-----56.2% of cases in 0 through 14 year-olds occurred in children ages 0 through 3 years

-----Highest incidence among 0 through 3 year-olds is in the 12 to 24 month age group

-----31.8% of burns in 0 through 3 year-olds were due to contact with a hot surface; 34.7% were due to hot liquid scalds

-----Child was burned in a private residence in 54.4% of the cases (NOTE: In 32.6% of the cases location of injury was listed as "other/unknown" so 54.4% is probably a conservative figure)

HEAD INJURIES

Household Survey: (excludes motor vehicle-associated head injuries)

-----9% of all families with children ages 0 through 14 years had head injuries serious enough to take to a hospital or physician

-----Of head injury cases ages 0 through 14 years 65% were from falls

-----There was no consistent pattern noted for the nature of the falls; children fell off of anything and everything!

-----28% of the head injury cases occurred at patient's home

-----Mother was the caretaker in 61% of the cases

CNS Trauma Study: (data base included inpatients only)

-----Of all non-motor vehicle injury cases in 0 through 4 year-olds 74.5% resulted from falls or jumps

- **Tabular Presentation**—San Diego Regional Poison Center calls are described in a two-way table relating age and ingested substance (Table 13).

- **Bar Graph Presentation**—The graph in Figure 6 shows the number of burn cases and case disposition by age for San Diego and Imperial Counties.

- **Linear Graph Presentation**—The Virginia project used linear graphs (Figure 7) to compare relative risks of poisoning. The graphs are based on two data sources—ED visits and interviews with parents. Relative risk is determined by calculating standard morbidity ratios (SMRs). SMRs compare the occurrence of a given injury among subgroups (in this case, age groups).

- **Pie Chart Presentation**—The Massachusetts project used the pie chart (Figure 8) to illustrate the nature of injuries among patients under six who were seen in emergency departments. Injuries are described by ICD code.

- **Combination Grid And Bar Graph Presentation**—The three-dimensional chart in Figure 9 was developed by the Massachusetts project. The chart graphically displays hospital admission rates by age group, for injuries resulting from burns, choking, falls, poisons, sports, and vehicles.

TABLE 13

TABULAR PRESENTATION
CALIFORNIA PROJECT

CALLS FOR POISONING (PERCENT)
BY SUBSTANCE INGESTED AND AGE
SAN DIEGO REGIONAL POISON CENTER
JULY - DECEMBER, 1978

AGE (Yrs)	HOUSEHOLD PRODUCTS	PLANTS	ASSORTED "CIDES"	DRUGS	OTHER/ UNKNOWN	TOTAL
0 - 3	1846 (43%)	642 (15%)	176 (4%)	1426 (33%)	190 (4%)	4280 (100%)
4 - 11	243 (29%)	112 (14%)	45 (5%)	252 (31%)	174 (21%)	826 (100%)
12 - 14	41 (32%)	5 (4%)	6 (5%)	40 (31%)	35 (28%)	127 (100%)

FIGURE 6

BAR GRAPH PRESENTATION
CALIFORNIA PROJECT

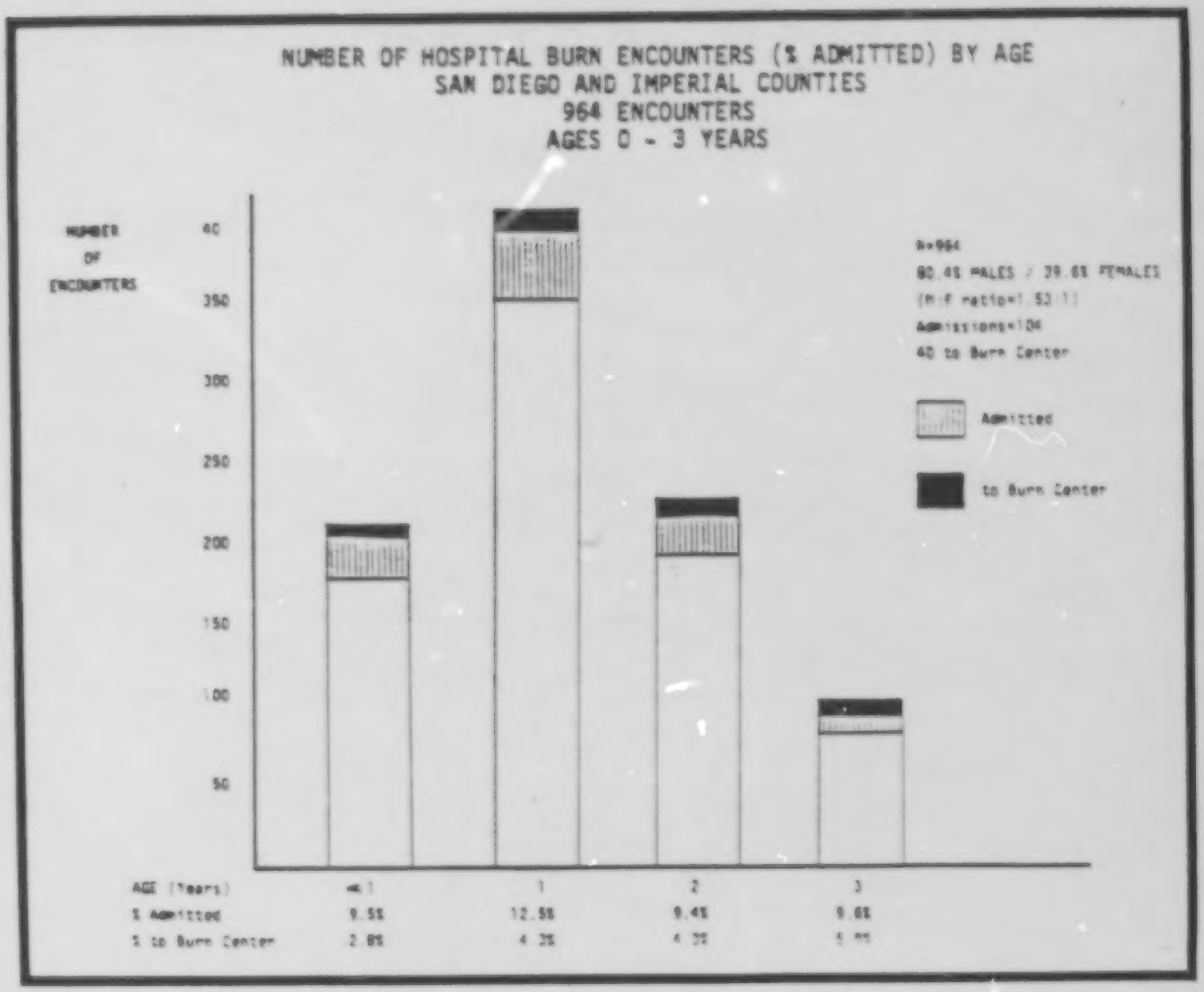


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FIGURE 1

LINEAR GRAPH PRESENTATION
VIRGINIA PROJECT

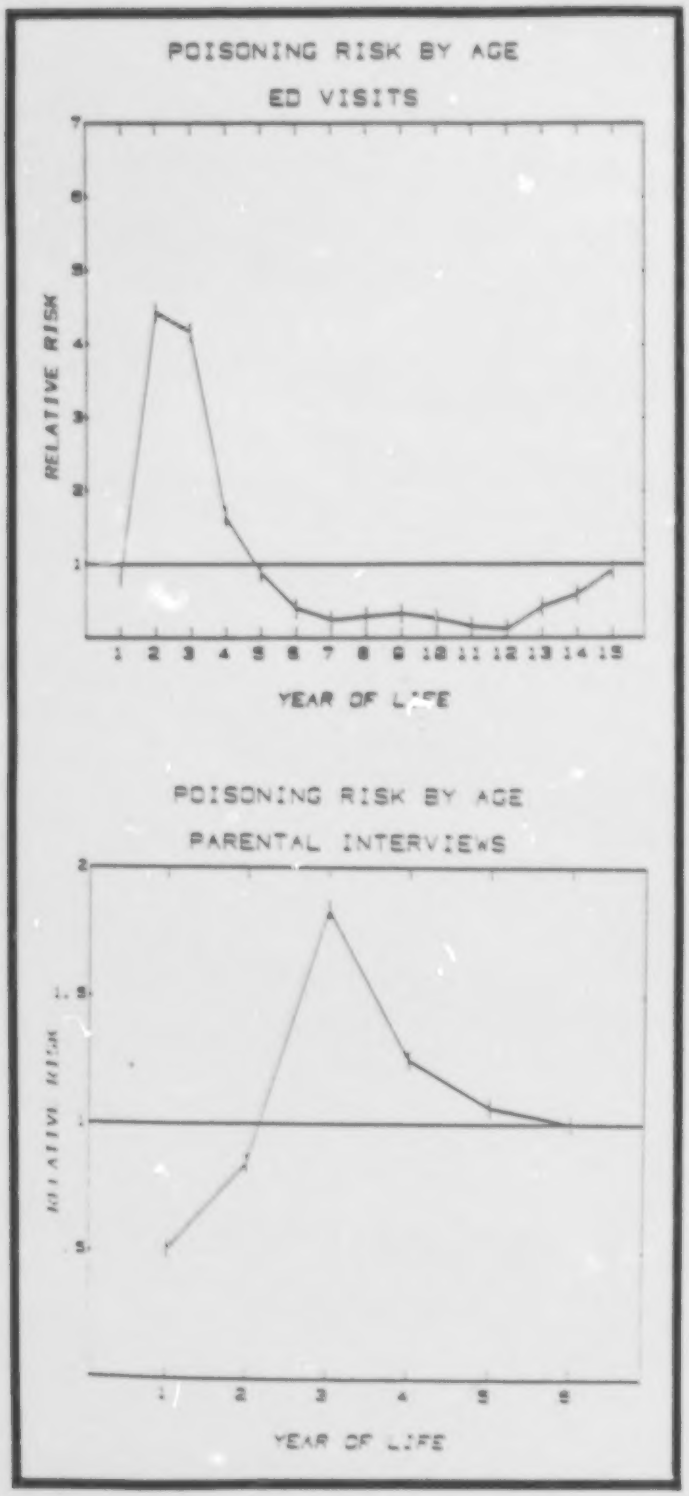


FIGURE 8

PIE CHART PRESENTATION
MASSACHUSETTS PROJECT

Nature of Injury by ICDA Codes
Patients less than 6 Years Old
Emergency Room Visits - (9/1/80 thru 2/28/81)
(n = 398)

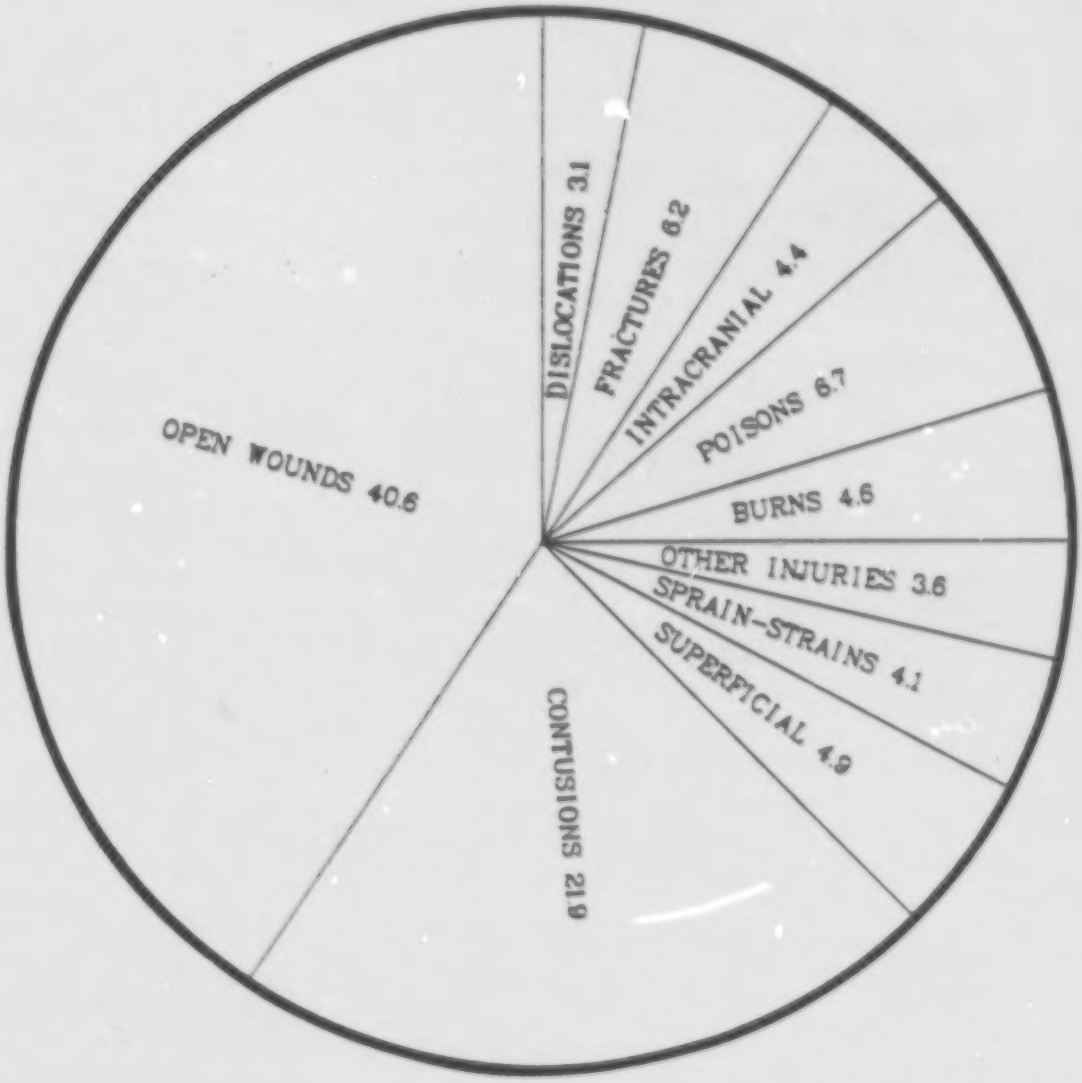
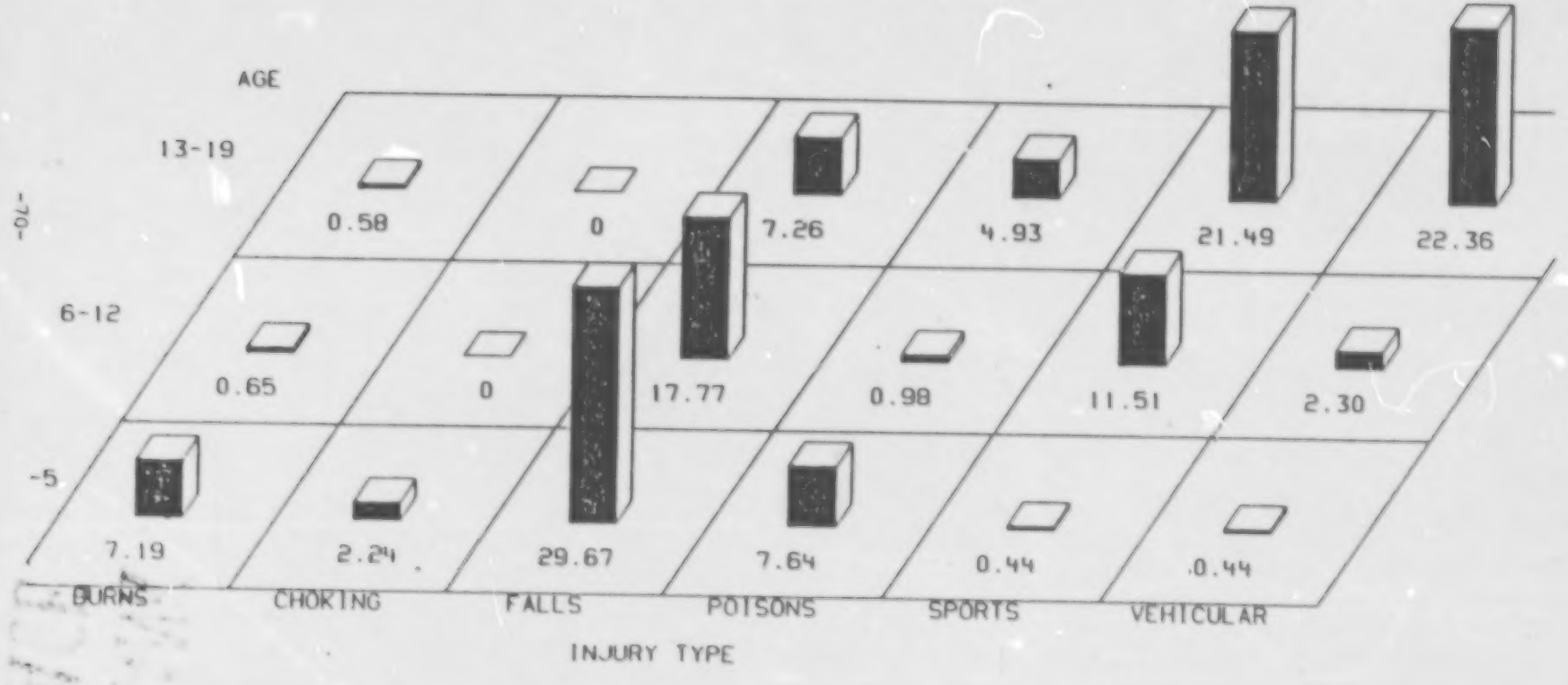


FIGURE 9

INJURY RATES BY AGE GROUP

HOSPITAL ADMISSIONS - ANNUAL RATE PER 10,000



SOURCE: Massachusetts Statewide Childhood Injury Prevention Project

CHAPTER FOUR

IV. GETTING STARTED: INITIAL PROGRAM PLANNING

Initial planning can begin once community needs have been assessed. This requires developing program support, setting goals and objectives, and obtaining necessary resources. To some extent these tasks are interactive. Program objectives must be drafted before seeking support, yet knowledge of what others are doing affects program objectives. Resources are needed to generate support, yet generating support consumes resources.

1. DEVELOPING SUPPORT FOR THE PROGRAM

The first tasks in establishing a program are to: (1) identify other interested entities (in State government, Federal government, and the private sector); (2) generate their support; and (3) create useful linkages to advance the program. Evidence that the program has broad support from the Executive Branch and a concerned public will enhance funding possibilities. Funding requests will be most likely to succeed if they are not competing with similar or conflicting proposals from other quarters. The following sections discuss identifying agencies and organizations, initiating contact and establishing linkages, and developing plans for a statewide advisory committee.

(1) Identifying Agencies And Organizations

Myriad agencies and organizations have an interest in injury prevention for children. Other departments in the State health agency, other State government entities, Federal programs, voluntary organizations, and professional groups may be involved or interested in prevention. Early contact with these parties can identify key people whose support is vital and may uncover potential areas of overlap and possibilities for coordination.

Start by determining which other State departments and programs deal with children or injury prevention. The list below developed by the Massachusetts demonstration project illustrates the scope of interest and involvement of various State agencies and programs:

- Environmental Health
- Preventive Medicine
- Family Health Services
- Emergency Medical Services, including the Poison Control System
- Food and Drug Administration
- Community Sanitation

- Health Statistics
- Health Regulations and Licensing
- Office For Children
- Department of Public Safety
- Department of Education
- Lead Paint Poisoning Program

Certain Federal-level agencies, some of which maintain local or regional offices, may be supportive. The Consumer Product Safety Commission, the National Highway Traffic Safety Administration, and the Center for Environmental Health of the Centers for Disease Control all are concerned with injuries.

Furthermore, because the Maternal and Child Health Block Grant mandates interagency cooperation with Federal programs such as Early and Periodic Screening, Diagnosis and Treatment (EPSDT), Medicaid, and Head Start, opportunities may exist for enlisting their support.

Many private sector organizations and voluntary and professional associations are likely candidates to assist in developing a program. Possible supporters include:

- **Medical And Health Related**—Medical Society, Hospital Association, Visiting Nurses Association, and local Medical Schools, Pharmacists, Emergency Medical Programs, Community Hospital Health Education Departments, Schools of Public Health
- **Voluntary Organizations**—National Burn Council, National Red Cross, and National Head Injury Foundation
- **Professional Associations**—Association Of Day Care Centers, Firefighters Association, Teachers Association, State Chapter of American Academy of Pediatrics, State Nurses Association, and others
- **Consumer Organizations**—Special interest groups formed by parents to address specific issues like sports injuries and product safety

(2) Initiating Contact And Establishing Linkages

Beginning within the State agency, set up meetings with program directors or department heads to introduce the proposed program. Ask that each unit recommend a representative to maintain contact with the MCH staff.

Create a climate of mutual support and trust by establishing ongoing ties. Next, move on to Federal programs and private sector organizations. Meet with their leaders to determine their interest in and capability to contribute prevention ideas and advice.

Keep in mind that initial inquiries serve three equally valid purposes: to become aware of existing programs, to identify supporting resources, and to smooth the political pathways over which the program will travel. Make sure that respondents clearly understand program objectives and the MCH role. Determine whether they have any objections and, if so, what might be done to minimize their concerns. Ask respondents whether they have plans for similar activities, whether they will support the program, and what role they want to play. Possible roles that governmental and non-governmental agencies might serve are:

- Provide financial or in-kind support
- Contribute information for the Title V Report of Description of Intended Expenditures (RDIE)
- Lend their name (and, thus, their credibility) to the program
- Serve in an advisory capacity to design program policies and prevention strategies
- Serve in a technical capacity to complete specific design, implementation, and evaluation tasks

Later, as the program becomes better defined, develop more formal linkages. Whatever linkages are established with interested parties should be spelled out clearly for all concerned. Agreements may contain some or all of the following elements, depending on the level of anticipated coordination:

- A statement of the mutual objectives and respective responsibilities of each party, including a description of activities to be undertaken
- A system to ensure exchange of progress reports
- Joint monitoring and evaluation of cooperative activities
- Periodic review of the agreement
- A mechanism to ensure continuing communication

(3) Organizing State-Level Advisory Committees

Two types of State-level advisory committees might be considered: a Statewide Advisory Board and a Government Coordinating Committee.

- **Statewide Advisory Board** members may be chosen from among organizations and professionals that express interest. Both public and private agencies should be represented. Members can be called on for funding, political support, or programmatic input. For example, if the program includes promoting legislation or regulation, Advisory Board members (professionals and consumers) can testify at hearings. Keep Board members informed with progress reports, use them on an individual basis, and avoid time-consuming, largely ceremonial meetings.

- The **Government Coordinating Committee** may be composed of State agency representatives. This Committee should meet monthly or quarterly to coordinate jointly-administered programs, share information about progress, and avoid duplication of effort.

A community advisory board also may be helpful, depending on program strategy and geographic scope. Community boards are discussed in Chapter IX.

2. SETTING GOALS AND OBJECTIVES

Setting program goals and objectives involves: deciding the scope of the program, selecting priorities, choosing an overall goal, and developing specific objectives to realize that goal.

(1) Determining Program Scope And Priorities

First, determine program scope. For example, will it focus on the whole State, or only on selected regions, counties, or communities? Will it focus on one or several injury areas? Several concerns can influence this decision:

- Does the injury problem appear more acute in some locales than others?

- Are resources available to implement a statewide program?

- Should new intervention strategies be tested on a small scale first to determine their effectiveness?

- In what injury areas are prevention programs already in place?

Preliminary decisions about overall program scope can be made at this point, but final choices of geographic areas should await further definition of the injury prevention strategy. Need is the primary criteria for selecting geographic area, but successful implementation also depends on such factors as: community characteristics, an organized health delivery system, a supportive power structure, and proximity of the priority area to program offices. Review Chapter IX before selecting target communities.

(2) Developing Goals And Objectives

Goals describe an ideal or nearly ideal state with regard to a specific problem; objectives are the ends that will have to be met before the goal can be realized. All injury prevention activities have similar goals. The Child Health Goals of the American Academy of Pediatrics, for example, include this one: "All children should live in a safe environment."

Objectives, on the other hand, are less sweeping and expressed in more quantitative terms. Conventional wisdom suggests that objectives should state desired program outcomes and should be measurable, time-limited with a specific achievement date, and area- or population-specific. "Promoting the Health of Women and Children Through Planning," (Division of Maternal and Child Health, 1982) defines these terms as follows:

- **Measurable**—Stated in numerical terms, indicating the present status and the desired future status
- **Time-Limited**—Having a specific deadline for completion
- **Area or Population Specific**—Related to a specific geographic area in which the problem is most acute or to an age group at highest risk

An example of this type of objective is "By 1983 in two counties, decrease the number of children under three hospitalized for burn injuries from 104 per year to 65 per year." A second illustration is "By 1988, increase from 20 percent to 50 percent the proportion of children under five who travel in child auto restraints."

Despite the desirability of such precisely stated objectives, many programs may find it difficult to predict quantified changes in behavior or injury rates. For example, is it reasonable to expect to reduce burns by 10 percent, by 25 percent, by 50 percent? In such cases, process objectives may also be necessary. These objectives describe the concrete chronological program accomplishments in as measurable terms as possible. Examples of process objectives include:

- By March 1984, conduct a baseline survey in three counties to determine the incidence and epidemiology of burn injuries among children under 10.
- By July 1984, use survey data to develop targeted injury prevention programs aimed at reducing burns.

- Between September 1984 and September 1987, implement the programs in the three counties affecting 250,000 target children.

- By September 1988, monitor and evaluate the incidence of injuries over the three years, analyze findings, and prepare report.

In stating program objectives, guard against "biting off more than you can chew." Conservative objectives have the best chance of being achieved. Target narrowly and specifically: choose a limited number of injury types and age groups. Sometimes, epidemiological data may reveal diverse problems. In such cases, find a common core on which to build. The California project epidemiological study showed that children under four were at the highest risk for poisoning and burns, but slightly older children were at the highest risk for falls. For cohesiveness, the project concentrated on children under four and developed age-appropriate interventions for the three injuries. Also, carefully estimate the time required to achieve objectives; check with experienced professionals or technical experts. The demonstration projects consistently underestimated the time needed for data collection and for laying the groundwork for program implementation.

3. OBTAINING RESOURCES

Before proceeding further, determine where funding will come from and the expected amounts. This section discusses possible funding sources and proposal preparation and promotion.

(1) Identifying Sources Of Funds Or Contributions

Resources to develop and implement injury prevention programs may come from a number of sources: State government, Federal agencies, private sector health-related entities, or business organizations. Some potential funding sources may be represented on the Advisory Board. A new injury prevention program may be competing with already established service delivery programs facing budget cuts. Therefore, a successful bid for funds will require a well documented justification. Requests should be economical, offset by supplemental funds and in-kind contributions from other sources.

Public Sector: Some Federal government programs may provide funds or technical assistance for injury prevention programs. For example, the Center for Environmental Health, Centers for Disease Control, have become active in the injury prevention area, providing training and technical assistance. The Consumer Product Safety Commission has contributed monies for some demonstration projects. The Department of Transportation and the National Highway Traffic Safety Administration may be willing to assist with motor vehicle-related injury activities. Some State legislatures have appropriated funds for Poison Control Centers. Some medical centers, university systems, and agencies of the Public Health Service, DHHS, such as FDA, CDC, and HRSA have provided expert consultation and advice. Schools of medicine and public health also may be a source of student intern staff and computer time.

Private Sector: Look first for assistance from health organizations like hospitals, pharmacies, and insurance companies. Pharmacists in California co-funded the ipecac advertising campaign. The Massachusetts Poison Control System is planning a hospital-based poison prevention program that will be jointly funded by the Massachusetts Blue Cross/Blue Shield and the Massachusetts Hospital Association. Rochester Blue Cross financially assisted the New York State Health Department with its poisoning intervention effort. Electrical and gas utilities may support burn prevention programs. Corporations with day care centers can promote injury prevention to their employees. Community-oriented businesses may donate funds as a public relations gesture; for example, in California helium distributors donated tanks to fill promotional balloons distributed at health fairs. Experience has shown that private sector organizations are more willing to pay for tangible items, like brochures or advertising, than for salaries and routine operating expenses.

(2) Preparing Funding Requests

After identifying potential funding sources, prepare a program funding request to convince these sources that the program deserves support. Each must be tailored to the audience. Government agencies usually require a very specific and comprehensive proposal and may require a specific format. Proposals to non-government agencies may be less formal and more flexible in approach.

All program funding requests will cover the elements of needs assessment, goals and objectives, program description, and data collection. The purpose is to single out the most relevant data and present it in a comprehensive and concise manner to justify need for action.

The method of presentation depends, of course, on the point to be made. For example:

- Is the situation getting worse? Then trend data should be used.
- Is the situation more acute in some locales than in others (e.g., in this State compared to other States)? Then comparative data should be used.

Keep in mind that every audience is comprised of some people who relate better to graphic presentations and some who relate better to narrative presentations. Prepare a funding request that appeals to both. First, summarize the main facts in a few paragraphs or pages (using clear headings, "bullets," and so on). Second, display the main facts in plain English; avoid jargon; relegate technical explanations (e.g., of the survey method, data limitations, statistical significance) to footnotes; voluminous back-up data can be submitted in appendix form for curious, suspicious, or leisured audience members to study at length.

Take special care in preparing bar graphs, pie charts, trend line charts. Avoid putting too much information on each chart because doing so obscures the most important points. Indicate the sources of all data.

The numbers and dollars alone do not tell the entire story of avoidable childhood injuries. While stopping short of exploitation and sensationalism, the funding request can contain anecdotal evidence of the nature and extent of the problem. In selecting anecdotal data, focus on situations that might have been prevented by the type of strategies proposed (if the strategy is firmly developed) or by strategies known to be implemented elsewhere. Consider:

- Monitoring the mass media to identify newspaper and magazine articles about avoidable injuries to children (e.g., a fire in which no smoke detectors were present, a boating accident in which no life preservers were on board). Prepare summaries of the reported cases.

- Surveying communities suspected of being at high risk. Document and photograph hazards (e.g., playgrounds with unsafe equipment and conditions, unmarked obstacles, shallow water where children frequently swim, children at play without proper safety equipment). This can be especially effective when trying to convince community organizations to donate resources.

This portion of the request is designed to evoke feelings, yet must do so with care. Strive to evoke concern and to generate empathy in the audience; despite any dismal facts presented, the request also should generate feelings of hope and can do so by pointing out not only the tragedy of what has occurred in the past but also the real potential for avoiding such unnecessary injuries in the future.

(3) Presenting The Request For Program Funding

Once the funding request is complete, determine how to present it to decision-makers. This may involve face-to-face meetings, public hearings, and media coverage. Meetings, of course, should be held with all the Advisory Board members and other potential funding sources identified earlier to acquaint them with additional details contained in request and solicit their support in testifying at public hearings and obtaining media coverage. In addition, program staff should meet with legislators serving on appropriate committees. Legislative action may be needed to approve new appropriations or changes in legislation. Get support from legislators as early as possible.

Public hearings, held over time or throughout the State, can attract notice of the media and the general public. At hearings, arrange to have victims, parents, medical professionals, fire department personnel, police, and others recount episodes of avoidable injuries to children.

Depending on the audience and the circumstances under which the proposal is to be presented, dramatization may be appropriate. If given the opportunity to testify before the legislature, for example, and if the program focus is household safety, consider bringing in samples of dangerous cleaning supplies, tools, toys, and clothing commonly found in the home; demonstrate

how easily these products can be misused, opened, set afire, or otherwise used improperly. Bring examples of safe products and point out the features (especially the least expensive features) that render them safe.

Media coverage and public hearings can help generate support for the program. Newspaper editors may be contacted; radio and television news directors should be informed and interviews on talk shows arranged. Chapter VI discusses how to maintain media coverage.

PART B: DESIGNING THE PROGRAM

After getting support for a childhood injury prevention effort, working out the details of program design can begin. This involves:

- Using epidemiological data gathered during the needs assessment to choose target age groups and injury types
- Deciding what type of strategy to employ
- Selecting interventions that support the strategy
- Developing materials to implement the program

Much work has already been done in designing injury prevention programs and Part B draws extensively upon it. It is divided into three Chapters:

- **Chapter V: Formulating the Strategy**—This Chapter explains how to target the strategy and select and sequence strategy components; it also discusses several internal and external factors that might influence program design.
- **Chapter VI: Surveying Prevention Approaches**—This Chapter reviews educational, technological, and governmental interventions tried by other childhood injury prevention programs or suggested by injury prevention experts.
- **Chapter VII: Designing Prevention Materials**—This Chapter provides guidance in developing materials to promote the overall program and to support specific prevention interventions. It discusses the advantages and disadvantages of buying or building upon existing materials, in contrast to designing new materials.

CHAPTER FIVE

V. FORMULATING THE STRATEGY

After learning which injuries are most problematic and identifying the host-agent-environment configuration that underlies them, strategy formulation can begin. A strategy can be a single intervention or a series of interconnected interventions. An intervention is one distinct activity having these components:

- A narrowly focused objective
- A selected population at risk
- A target audience for the intervention
- A design that spells out specific steps through which the prevention intervention will reach the target audience
- An implementation plan discussing how the design will be realized
- A materials plan describing the media through which the prevention intervention message will be conveyed

Formulating the strategy involves making these decisions:

- Which injury types and age groups should be targeted?
- In which intervention categories—education, technology, or governmental action—should work be conducted?
- What injury phases—pre-event, event, or post-event—should be stressed?
- How many and what kinds of interventions should be selected?
- In what sequence should interventions be arranged?

Answers to these questions establish a basic framework for building a detailed design. This Chapter is divided into four sections. The first two discuss how to target the strategy and how to select and sequence strategy components. The last two present sample strategies and outline important internal and external factors to consider in choosing a strategy.

1. TARGETING THE STRATEGY

The first decision concerns the targets of the strategy. At which injury types and populations at risk shall efforts be directed? The decision will be guided, of course, by overall objectives of the Maternal and Child Health Program and the

epidemiological data. Within those constraints, however, three different targeting approaches are available. These are displayed in Figure 10 and discussed below:

- **Horizontal Targeting**—A horizontally-targeted strategy simultaneously attacks multiple injury types for which one age group is at risk. An example of this strategy is educating parents of one to three year olds about the poison, burn, fall, and motor vehicle hazards that their children face.

- **Vertical Targeting**—A vertically-targeted strategy pinpoints one injury, such as burns, and develops interventions aimed at the various types of burn hazards—excessive tap water temperature, hot liquid spills, fireworks, flammable liquids—for which each pediatric age group is at risk.

- **Specific Targeting**—A specifically-targeted strategy concentrates on a single problem that causes injuries for a particular age group. One illustration of this approach is a campaign to reduce aspirin poisoning by using childproof closures on containers.

These targeting approaches are not mutually exclusive; one, two, or all three approaches can be combined in one strategy.

2. SELECTING AND SEQUENCING STRATEGY COMPONENTS

After identifying targets, select the intervention categories and injury phases that will form the framework for choosing interventions. Interventions fall roughly into three categories:

- **Education**—Convincing parents and other responsible adults of the need for adopting injury prevention behaviors—e.g., keeping a child's own medicine (vitamins, aspirins) out of reach. All educational interventions promote active measures and require behavior modification and individual action.

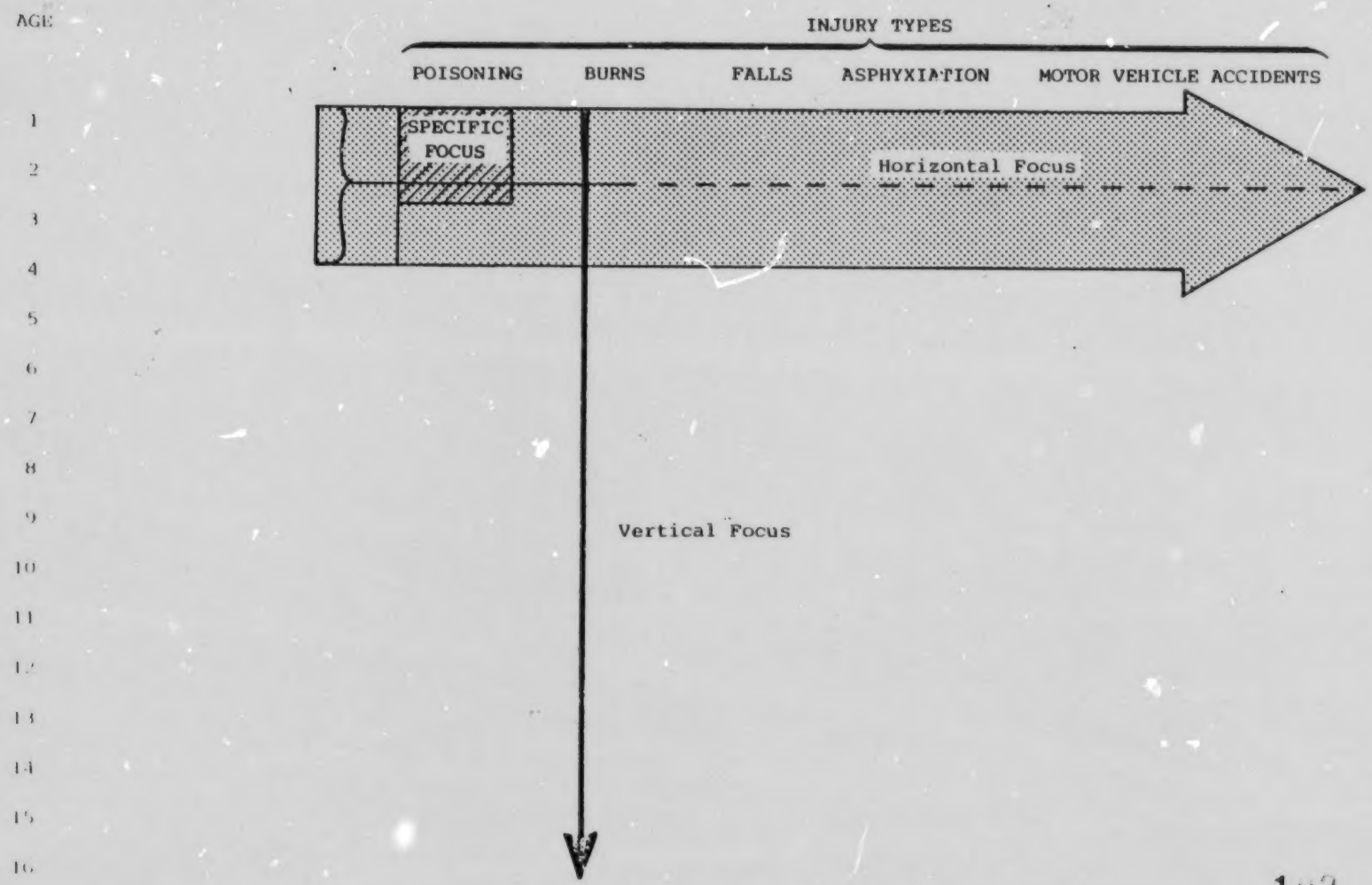
- **Technology**—Designing and using engineering to reduce or eliminate hazards—e.g., cabinet locks for cupboards containing medicine or medicine bottles packaged with less than the fatal dose for children. The former is an active measure; the latter, which requires no individual action, is a passive measure. Both are designed to prevent poisonings.

- **Government Action**—Promulgating regulations and legislation to mandate changes in technology or behavior—e.g., requiring that all medicine be sold in childproof containers or requiring that all medicine in State-licensed daycare centers be kept out of children's reach. Interventions based on government action can be passive, like the first example, or active, like the second.

These categories also are called the three E's: education, engineering, and enforcement.

FIGURE 10

THREE POSSIBLE TARGETING APPROACHES



Injury phases also can be described in three stages:

- **Pre-event—Factors that create the potential for injury**—e.g., lack of parental knowledge about poisonous household products
- **Event—Factors that affect the severity of the injury**—e.g., quantity of potentially poisonous medicines are available in a single container
- **Post-event—Factors that influence the outcome of the injury**—e.g., calling the poison center if a child swallows a suspected poison

The following matrix is useful in selecting strategies:

TABLE 14

STRATEGY SELECTION MATRIX

Injury Phases	Intervention Categories		
	Education	Technology	Government Action
Pre-Event			
Event			
Post-Event			

A strategy can be comprised of interventions corresponding to a single, many, or all cells; the more cells addressed by interventions, the greater the chances for affecting targeted problem(s). Table 15 displays a completed matrix for a specifically-targeted strategy to reduce scald burns among children up to four. (This matrix is only an illustration and should not be viewed as an actual strategy.)

The next step is deciding in which cells to concentrate interventions. A total educational strategy, for instance, could deliver prevention messages for all injury phases (as shown in the first column of Table 15). This strategy would create parental awareness of burn hazards, encourage use of smoke detectors, and instruct parents in first aid techniques. Alternatively, a strategy can crosscut all intervention categories in a single phase. For example, a pre-event phase strategy could educate parents about the dangers of high hot water heater temperatures, lobby manufacturers to produce safer appliances, and convince authorities to pass appliance safety laws.

TABLE 15

STRATEGY FOR REDUCING BURNS

INJURY PHASES	INTERVENTION CATEGORIES		
	EDUCATION	TECHNOLOGY	GOVERNMENT ACTION
Pre-Event	Create awareness in parents concerning the dangers of scald and flame burns	Convince manufacturers to make hot water heaters with maximum temperatures of less than 130°	Publish regulations prohibiting manufacture of water heaters with maximum temperatures greater than 130°
Event	Encourage installation of smoke detectors and regular battery checks	Promote use of non-flammable materials in all children's clothes	Require fire extinquishers in the halls of all apartment buildings
Post-Event	Acquaint parents with first-aid techniques	Establish a burn hotline for parents to call in case of emergency	Fund burn trauma centers in strategically placed hospitals

When resources are inadequate to implement a multi-intervention strategy, consider beginning with an educational strategy in the first year to lay the groundwork. After creating a climate of public support, expand into technological and government action interventions in later years. This process is known as sequencing.

3. REVIEWING SAMPLE STRATEGIES

Formulating a strategy involves making choices about the strategy focus (injury type and target age groups), intervention categories, and injury phases. Four strategies with different components illustrate the various possibilities:

Strategy Components	Examples
• Horizontal Focus Education Category All Injury Phases	The California project had a horizontal focus on three injury types (poisonings, falls, and burns) for one age group (children up to four). It concentrated on one intervention category—education—and targeted its interventions to one group--mothers of children within the age group at risk. The project used multiple channels—physicians, day care centers, etc.—to reach mothers with prevention information about all injury phases: anticipate (pre-event), prevent (event) and know what to do (post-event).
• Vertical Focus Education Category All Injury Phases	Project Burn Prevention (PBP), part of the Massachusetts project, had a vertical focus on one injury (burns) among all age groups. Like California, it stressed education in schools and through mass media and community outreach. It disseminated prevention messages about each age group and for each injury phase.
• Specific Focus All Categories Pre-Event And Event Injury Phases	In Massachusetts, The Child Auto Passenger Safety (CAPS) project focused specifically on preventing motor vehicle injuries among children five and under. Among its activities, the project educated the general public and maternity patients about the need for and use of child auto restraints (education); promoted correct car seat use through shopping guides and loan programs (education/technology); and worked for passage of a mandatory restraint law (government action). In addressing the pre-event phase, CAPS created awareness that unrestrained children run a great risk of serious injury in a car crash.

	In the event phase CAPS worked to mandate care seat use to minimize or eliminate injury when crashes occur.
• All Foci All Categories All Phases	The Massachusetts project believed in the synergistic effect of implementing multiple interventions in a single community. Project staff incorporated the vertically focused education efforts of Project Burn Prevention and the specifically focused education, technology, and government action efforts of the Child Auto Passenger Safety project. It also developed a government action intervention based on housing code inspections; this included an education activity (parental counseling) and a technology component (installation of safety equipment). Working with the Massachusetts Poison Control System, project staff promoted use of the poison control center as an emergency hotline. Their Pediatric Accident Prevention Project (PAPP) intervention counseled parents about potential hazards, preventive behaviors, and first aid techniques. Thus, the Massachusetts project strategy filled many of the cells shown in Table 15.

4. CONSIDERING INTERNAL AND EXTERNAL FACTORS

Before making final decisions about targets, strategy components, and interventions, consider several internal (organization) and external (community) factors that may influence the chance for program success.

(1) Internal Considerations

Several internal organization characteristics affect strategy design:

- The resources available versus the resources required to design and implement the strategy—e.g., funding, staff availability, and staff time.
- Existing time constraints versus the time required to implement the strategy or particular interventions and show results. Remember that passive interventions generally require more time to implement than active interventions.
- The extent to which prevention interventions already have been designed and tested in a similar environment, or to which interventions must be designed from scratch. For example, the Massachusetts project had several already existing, tested interventions upon which to build its strategy.

- The need for legislative activity versus the constraints placed on State employees; if the State agency is implementing the strategy, lobbying for legislative action may be restricted.

(2) External Considerations

The characteristics and attitudes of the target community also may affect the strategy. Consider the following factors:

- Injury problems revealed by the epidemiological study may be overwhelmingly of one type; one age group may be disproportionately at risk for all injuries or a frequent injury may be amenable to only one intervention category (e.g., bathtub drownings can be prevented only by an adult presence). Thus, the targets of the strategy and interventions may be limited.

- Community readiness to accept the project strategy can influence decisions as well. A positive climate for a strategy may be evidenced by:

  - External influences that combine to make a required action more acceptable—e.g., the campaign to lower hot water heater temperatures may benefit from extensive publicity given to energy conservation.

  - Previous educational efforts that have created awareness of the problem and an understanding of what needs to be done—e.g., volunteer activity promoting car seats can set the stage for legislative action.

  - Recent occurrence of an injury in the community can increase receptivity to prevention messages—e.g., house fire, poisoning.

- The support of health care providers is critical because of their credibility with and access to target populations.

- The support of local community leaders also is crucial. All three demonstration projects found local leadership to be particularly important to successful implementation.

Chapter IX, which contains tips on selecting, approaching, and organizing a community, discusses these factors more thoroughly.

CHAPTER SIX

VI. SURVEYING PREVENTION APPROACHES

This Chapter presents a sampling of potential interventions in three categories: education, technology, and government action. Many of the interventions outlined here come from the three Title V/MCH demonstration projects: California, Massachusetts, and Virginia. Others are drawn from the literature. Some prevention approaches introduced in this Chapter are explained more fully in intervention profiles located at the end of each major section of the Chapter.

EDUCATION

Education is the most often tried prevention approach; making the public aware of specific childhood dangers is a necessary prelude to further injury prevention efforts. Witness the increase in car seat use among children. Until motor vehicle injuries were recognized as a problem and the public informed about the risks of unrestrained travel, car seats were not invented nor legislation mandating their use passed.

Educational interventions described here, however, go beyond just creating awareness; they also encourage behavior change by:

- Highlighting circumstances surrounding the injury—e.g., babies may be scalded by hot coffee when adults carry both simultaneously.
- Promoting adoption of preventive behaviors—e.g., do not carry hot coffee and a baby at the same time.
- Teaching first aid techniques to use when injuries occur--e.g., put cold water on burns immediately.

Motivating people to change their behavior is difficult. In assessing whether to adopt a preventive behavior, most parents follow a complex decisionmaking process that includes:

- Weighing the perceived seriousness of the risk against the anticipated rewards and difficulties of adopting the behavior—e.g., what is the likelihood my toddler will eat poisonous cleansers stored under the sink versus my inconvenience if I store them in a locked cabinet?
- Determining if they are able to implement the preventive measure—e.g., can we afford to buy the locks? Who will install them?
- Seeking reinforcement from health professionals, friends, relatives, and the mass media—e.g., does my neighbor or doctor recommend cabinet locks? Did my mother use them?

Behavior change also depends on how frequently behavior is required. Parents are more likely to turn the hot water heater temperature to 120 (which requires a one-time action) than to remember daily to remove hot liquids from a child's reach.

Yet, despite the difficulties, a change in daily behavior is the only possible prevention measure in many cases. For instance, toddler bathtub drownings can be prevented solely by adult presence; only an adult can place a baby in a car seat. Further, even if educational efforts do not result in widespread behavior change, they may create a large, aware constituency for promoting technological, regulatory, or legislative change that do not rely heavily on behavior modification.

The challenge in developing educational interventions lies in addressing each decision point—convincing people that the risks are real and that rewards are tangible, removing possible implementation barriers, and publicizing the desired behavior to create a positive climate for change.

Educational interventions vary depending on injury types addressed, age ranges of children at risk, intervention audience (professionals, children, or adults), by gatekeeper, and materials and media used. The next six sections discuss professional education and public education through health providers, school systems, businesses, community organizations, and the mass media.

1. PROFESSIONAL EDUCATION

Encouraging health, child care, and other care-giving professionals to promote injury prevention among parents and children is critical. By educating such professionals and securing their commitment to prevention, a program can take advantage of a multiplier effect, reaching many more target groups than otherwise possible. Moreover, fostering professional interest in injury prevention might have permanent results outlasting the program itself. Educational interventions can be directed to students or practicing professionals, as described below.

(1) Education In Professional Schools

Incorporating injury prevention in professional school curricula is an effective means for ensuring professional awareness. For example, the Massachusetts project designed injury prevention curriculum for preventive medicine classes at a local medical school. In addition, project staff delivered lectures to the medical students. Enthusiastic student response led to similar classes in two other medical schools and two schools of public health.

The California project developed an injury prevention component for a child development program at a local college. Instructors used project materials and pre- and post-tests to teach future child care professionals about prevention techniques. The project also accessed parents through the Child Development Laboratory, a daycare program connected with college programs.

(2) Education In Practice Settings

A second approach is to educate professionals in practice settings. Diverse inservice injury prevention and treatment education programs can be implemented, as discussed below.

In-service training for professionals formed an integral component of the California project overall strategy. The first step was training gatekeepers—childbirth educators, day care licensing evaluators, nurses—in injury prevention messages and techniques. Once educated, gatekeepers delivered the intervention to parents.

New York State's Monroe County Poison Prevention Demonstration Project also trained community professionals. Over a two-year period, the project conducted 51 one and a half hour seminars for nearly 4,000 professionals who have contact with parents of young children. Audiences included firemen, visiting nurses, social case workers, and inner city outreach workers. The seminar discussed proper purchase, use, and storage of toxic household substances. It was based on an audiovisual slide presentation and participants were given printed materials. Pre- and post-tests were administered to determine seminar effectiveness (Fisher et al 1980).

The Massachusetts project, through the Child Auto Passenger Safety (CAPS) program, designed and implemented an auto restraint training program for hospital maternity nurses and health educators. The training encouraged hospital staff to educate maternity patients about child auto safety during their hospital stays. The course covered the dangers of unrestrained travel, the purpose and basic types of child restraints, and guidelines for correct use. Trainers suggested ways to integrate child auto safety education into existing hospital health education programs and to develop new programs, like a car seat loaner activity. Participant certificates were given to attendees who completed the course. (See Profile 1)

The Virginia project developed a workshop titled "Management of Acute Poisoning" for physicians and nurses and gave the workshop in 45 hospitals over two years. The workshop focused on the epidemiology of pediatric poisoning, toxic principles, treatment strategies, and use of the poison control system. Project staff also presented papers at toxicology conferences and published articles in professional journals.

The Massachusetts Poison Control System (MPCS) sent letters to the Directors of Continuing Education in hospitals throughout the State. The letter offered to sponsor continuing education programs on poison prevention in young children and on managing poison patients. Directors were asked to indicate: (1) the topics of interest, (2) possible format for the educational program, and (3) program audience. Response was enthusiastic and MPCS held 17 presentations at program hospitals, usually through grand rounds. MPCS and Massachusetts project staff also conducted hospital-based training seminars for nurses, social workers, disaster workers, and physicians on topics ranging from poison center operation to management of particular poison cases.

2. PUBLIC EDUCATION

Because health care professionals are responsible for maintaining the health of their patients, they have credibility with parents. Thus, health providers are an important channel for injury prevention messages.

For instance, public health nurses may counsel mothers of newborns during home visits or counsel parents during clinic appointments. Hospital nurses can describe injury prevention techniques to maternity patients or distribute material to parents of hospitalized children.

Three major educational program options are discussed below: anticipatory guidance in primary care settings, prevention education in pre- and post-natal programs, and prevention education in hospital pediatric wards.

(1) Anticipatory Guidance In Primary Care Settings

Anticipatory guidance involves counseling parents to anticipate hazards faced by children in each developmental stage and to take measures to reduce the risk of injury. While many health care providers regularly counsel parents during well-baby visits, time constraints and the focus on more "traditional" aspects of child health sometimes limit attention given to the "new" morbidities (i.e., injuries). All three demonstration projects implemented anticipatory guidance approaches:

- As part of the California project, pediatricians, nurses, and health educators counseled parents during well-baby visits. Health care providers reinforced prevention messages contained in project materials distributed to parents. Four age-appropriate anticipatory guidance sheets highlighting potential hazards and first aid techniques for poisons, burns, and falls were developed. Providers gave parents the appropriate sheet and a pre-packaged kit of other prevention materials, including a poison center telephone number and a bottle of ipecac. Providers were trained to implement the intervention in private pediatrician and general practitioner offices, public health clinics, and community clinics. Assessment of the intervention found providers easily able and willing to adopt injury prevention counseling as part of the well-baby visit and receptive to the materials, especially the anticipatory guidance sheets. (See Profile 2)

- The Massachusetts project, adopting an intervention developed by a Framingham pediatrician, used three age-appropriate safety surveys. Each contained a series of multiple choice questions to test parents' knowledge of safety hazards. Wrong answers were automatically recorded on the second page by a specially designed carbon transfer. Parents completed the questionnaire during well-baby visits, before seeing the provider. The pediatrician or nurse counseled parents only on subjects in which they scored poorly. Supporting materials included a file folder containing hand outs on specific injury prevention topics and a safety supply display board (upon which

were mounted sample outlet covers, cabinet and drawer locks, shock stops, and ipecac). A time study found that it took seven minutes to complete the questionnaire and receive counseling; counseling alone required about three minutes. (See Profile 3)

- The Virginia project combined counseling by health educators during well-baby visits with periodic mailings of prevention materials. Health educators followed a script focusing on awareness of household hazards and knowledge of appropriate first-aid. The counselors used questions and visual aids (e.g., pictures, safety supplies) to promote interaction with parents. They distributed prevention materials, such as burn and poison hazard checklists, ipecac, and Mr. Yuk stickers. Mailings to parents, one and eight months after the initial counseling, contained seasonal hazard warning sheets and other prevention materials. (See Profile 4)

The American Academy of Pediatrics, in conjunction with DHHS/MCH and the California project, is developing its own anticipatory guidance package to promote national integration of prevention counseling into pediatric practice. The package is composed of:

- A policy statement defining the AAP commitment to make safety anticipatory guidance an integral part of the preventive health care given by pediatricians
- A schedule of minimal safety counseling to be performed at specific preventive health visits
- An implementation package to assist pediatricians in carrying out safety anticipatory guidance in a systematic and time efficient manner. The package includes:
  - The Massachusetts safety survey questionnaires
  - The California age-appropriate anticipatory guidance sheets
- An injury control curriculum for medical students and house staff (including written and audiovisual materials)

The AAP package will be available in Spring 1983.

(2) Education In Pre- And Post-Natal Settings

Prospective and new parents usually are eager and receptive to parenting information, including injury prevention messages. By convincing the health care professionals who run pre- and post-natal programs to incorporate safety counseling, a program has an excellent opportunity to reach this audience at a most favorable moment. Such counseling can take place in two settings: through childbirth education classes and during the mother's stay in the maternity ward.

Many kinds of educational interventions can be implemented in these settings. For example, the California project enlisted childbirth educators and community volunteers to teach injury prevention to nearly 4,000 prospective parents in childbirth education classes. Educators and volunteers received training and a protocol for conducting the class. Participating parents first took a six-question pretest to assess their knowledge of childhood accidents. Then they saw a slide show on injury prevention techniques and first aid. A post-test followed. Class leaders also distributed prevention materials, including the anticipatory guidance sheet for children from birth to six months.

Maternity patients offer a somewhat captive audience for prevention education. The Monroe County Poison Prevention Demonstration project distributed 168,000 poison information leaflets to maternity patients. A letter from the County Director of Health about poisoning prevention was included in the birth certificate mailing (Fisher et al 1980). Maternity nurses can counsel patients about the need for child auto restraints, establish car seat loaner programs, and employ anticipatory guidance approaches adapted for in-hospital use.

(3) Education In Hospital Pediatric Wards Or Emergency Rooms

Most health professionals agree that parents are more receptive to injury prevention counseling during well-baby visits than during acute care visits. During the latter, parents are too concerned about the immediate situation to comprehend other information. Additionally, if the child is being treated for an injury, mention of what the parent might have done to prevent it can exacerbate guilt feelings. Even so, some parents come in contact with health care providers mainly through the emergency department and usually when the child is sick. Therefore, this segment of the population can be reached only through the hospital.

The California project introduced injury prevention counseling in the emergency department and on the pediatric floor. Nursing staff were trained in injury prevention messages and asked to counsel parents when their children were discharged. They were asked to distribute pre-packaged prevention kits including the "Prevention is No Accident" brochure, a coloring book on burn prevention, and a poison center telephone sticker. Results differed between the two departments. Emergency department nurses felt overburdened and lacked time to distribute kits or reinforce messages. Pediatric floor nurses, on the other hand, easily implemented the program and reported that parents enjoyed receiving the materials. They also suggested counseling parents earlier in the hospital stay for two reasons: (1) counseling soon after admission would permit a greater amount of time for nurses to interact with parents about prevention and (2) delivering prevention messages is difficult amidst the confusion surrounding discharge and patients' eagerness to go home.

3. EDUCATION IN THE SCHOOLS

Schools provide a channel to both children at risk and their parents. Injury prevention education programs have been developed for preschoolers, elementary, junior high, and high school students, primarily concerning poisoning and burns. Parents become involved through materials sent home with children and through shared learning experiences. Illustrative programs are reviewed below:

- **Preschool Prevention Program For Parents**—The California project believed preschool teachers could effectively incorporate prevention messages concerning poisoning, burns, and falls in regular discussions with parents about child development. The staff trained preschool teachers in the injury prevention messages and provided each teacher packets of injury prevention materials to distribute to parents. Teachers also displayed project posters bearing injury prevention messages. (See Profile 5)

- **Poisoning Prevention Program For Preschoolers**—The Virginia project developed a program for at-risk three to five year olds. The program was based on an original study of children's cognitive abilities. It included a slide show with the message "don't drink or eat anything without asking mommy or daddy first," songs, posters, and poison prevention handouts to take home. Staff suggested teacher followup activities to reinforce the initial learning. (See Profile 6)

- **National Poison Center Network (NPCN) Program**—The NPCN, best known for the Mr. Yuk program, teaches parents by giving children poison information to bring home from school. In this way parents and children learn together, reinforcing the knowledge of both. Kindergarten and first grade programs identified various forms of poison and explained their dangers. Teachers used aids such as a ten-part slide show with audio cassettes, posters, Mr. Yuk stickers, and Good Arm materials. Parents were involved in two ways. First, poison prevention flash cards were sent home. A message on the back told parents what to teach children about the poison on the front. Second, the backs of the Mr. Yuk stickers were printed with names of generic products. Parents were requested to place stickers on designated products while explaining to their children that the products are poisonous and that Mr. Yuk means no.

- **Monroe County, New York, Poison Prevention Program**—This demonstration project conducted 75 poison prevention curriculum seminars, reached 5,000 representatives from nearly all county day care centers, nurseries, and elementary schools. Teachers introduced the curricula to about 45,000 children. Some classes also sent home "Poison Lookout Checklists" that were signed by parents and returned to school (Fisher et al 1980).

- **Blue Ridge Poison Center School Program**—As a component of the Virginia project, poison center health educators prepared a 30 minute cartoon slide show titled "The Poison Jungle." It focused on identifying poisonous products and featured pictures of look-alike products (e.g., a soft drink and radiator fluid). Designed originally for three to six year olds, it was modified for older children by adding prevention and early treatment messages.

- **Project Burn Prevention**—Project Burn Prevention, a program developed by the Shriners Burn Institute and the Education Development Center and adopted by the Massachusetts project, had programs for three age groups: four to seven years; seven to 12 years, and 12 to 18 years; it focused on preventing scald and flame burns and on emergency procedures. Each program was divided into units to allow teachers to implement the program during different lessons. Materials included filmstrips, case studies, activities, posters, and booklets to take home.

4. EDUCATION THROUGH BUSINESS AND INDUSTRY

Industry and business offer an important avenue for disseminating injury prevention messages to a large number of parents. Some, like pharmacies, view distributing prevention information and supplies as part of their mission. Some hope that participation will create additional traffic in the store. Others see participation as a community service and good public relations. Whatever their motivation, varied businesses have been enlisted by injury prevention programs. Five examples follow.

(1) Pharmacy Poisoning Prevention Campaigns

Pharmacists are perhaps the most natural business people to undertake a poisoning prevention effort. They often serve as a credible source of health care information and have excellent access to parents of small children. Many pharmacists feel their professional responsibilities include distributing such information. Both the California and Massachusetts projects developed pharmacy campaigns; the Virginia project used volunteers from the State hospital pharmacy association to give poisoning prevention presentations to school children. The California and Massachusetts interventions are described briefly:

- **Pharmacy Poisoning Prevention Campaign**—The California project organized 14 pharmacists in Escondido to distribute poison center telephone stickers, display posters containing injury prevention messages, and promote ipecac sales through a seven day advertising campaign. The advertising campaign was comprised of a newspaper advertisement featuring a discount coupon for ipecac, 18 paid radio spots, and 18 public service radio announcements.

- **Poison Prevention Campaign Through Retailers**—The Massachusetts project, in cooperation with the Massachusetts Poison Control System and the Massachusetts Society of Hospital Pharmacists, hardware stores, explored ways of involving retail establishments such as pharmacies, hardware stores, florists, and supermarkets. Pharmacies displayed ipecac posters, counseled parents about the need for ipecac, and sold it at cost or distributed it free during Poison Prevention Week. They also handed out prevention information pamphlets and poison center telephone stickers. Supermarkets and hardware stores distributed information pamphlets and florists distributed poisonous plant lists. This year, the Massachusetts project and several pharmacies sponsored a popular poster design contest for children in kindergarten through second grade. (See Profile 7)

(2) Supermarket Interventions

Both the Monroe County project and the California project involved supermarkets in prevention activities:

- **Retail Outreach Efforts**—The Monroe County Poison Prevention Demonstration Project held meetings and conferences with retailers to encourage them to comply with Federal regulations regarding childproof and safety packaging; to teach them about safe shelving practices; to encourage them to sell safety latches (and distribute discount coupons for such products); and to ask them to post signs about product hazards and proper use. To measure changes in retail behavior, Monroe County trained three volunteers as consumer surveyors. Between 1977 and 1979, the consumer surveyors visited 80 randomly-selected pharmacies, supermarkets, department stores, and hardware stores. They found (1) far fewer stores stocked non-conforming products, (2) increased use of proper shelving practices, (3) increased use of shelf warning signs, and (4) increased inventories and promotion of safety latches (Fisher et al 1980).

- **Supermarket Distribution Campaign**—The California project distributed posters, encouraged reshelving of toxic products, and posted signs urging that toxic products be stored out of children's reach. The project evaluation found mixed results. Although an in-store survey indicated that many mothers did not notice the signs, respondents to a random telephone survey mentioned the supermarket as a source of prevention information. Recently, one supermarket chain offered to print poisoning prevention information on its shopping bags. (See Profile 8)

(3) Hospitality Hostess Organizations And Other Business-Related Ideas

Many other types of businesses might be willing to participate in injury prevention campaigns. For instance the Hospitality Hostess and Welcome Wagon organizations provide good access to new community residents.

The California project enlisted a Hospitality Hostess to distribute accident prevention information to new families with young children. These organizations are an attractive conduit for information for two reasons. First, the stress associated with moving may increase a family's susceptibility to injury. Second, the family is unfamiliar with community resources available to help if injury occurs. The Hostesses counseled parents about accident prevention and gave out information about prevention, first aid for burns, poisonings, and falls; a poison control center telephone sticker; and a burn coloring book. In addition, the Hostesses told the family about community hospital, clinic, and poison control center resources. Both the Hostesses and the families enjoyed the discussions and packets.

Businesses may be willing to distribute prevention information concerning their products and services. A Massachusetts utility bought and distributed copies of Project Burn Prevention materials. Pool and boat equipment manufacturers and retailers can promote safety fencing around pools or life vests for boats. Wood stove retailers can distribute information about fire and burn safety.

5. EDUCATION THROUGH COMMUNITY ORGANIZATIONS

Many community organizations offer opportunities for educating children and parents about injury prevention. At organization meetings or community classes, staff or trained volunteers can present programs on one or more injury types. Program staff can train regular class or club leaders to give the program and institutionalize injury prevention in the curriculum.

The Massachusetts project organized an extensive community effort that reached nearly 5,000 children and adults in one year. Project staff targeted children at risk, older children who care for children at risk, and parents. Project staff and volunteers gave community presentations. Vocational schools were a valuable source of volunteers; students conducted presentations to satisfy course requirements.

These channels were found to be particularly effective in reaching children:

- **Babysitting classes at local hospitals, libraries, YMCAs, and YWCAs**—Children proved extremely attentive to accident prevention messages in this setting, and prevention messages can become institutionalized as part of the regular curriculum.

- **"What If...?" classes offered through the YWCA**—These after school programs taught children what to do in an emergency if they are home alone (e.g., "What if I'm home alone and there is a fire?"). Injury prevention techniques and first aid procedures formed an integral part of the course.

- **Day camps sponsored by the Parks and Recreation Department**—Project staff were able to reach six to twelve year olds as well as camp counselors.

- **Girl Scout and Boy Scout groups**—Learning accident prevention techniques fit nicely with certain merit badge tasks like safety and baby-sitting. The strong central organization and library facilitate institutionalization.

Channels effective in reaching parents included:

- **Mothers' groups accessed through churches, YWCAs, and Chambers of Commerce**—Members of mothers' groups found prevention information interesting and relevant.

- **Children's story hours in the local library**—Children's librarians have adopted injury prevention programs for parents who bring children to library activities. California staff also trained librarians to discuss accident prevention, hand out materials, and display posters.

- **PTAs**—Although PTA activity varies by community, speaking to PTAs opens doors for further presentations.

- **Lions, Kiwanis, Rotary, and Other Clubs**—Members of these clubs proved most interested in burn prevention and provided community support for other project efforts.

The content and materials of presentations varied. Massachusetts staff used the age-specific Project Burn Prevention kit for children and used the community outreach kit for adults. The kits contained films, exercises, games, and handouts. Project staff also tailored speeches on other injuries for individual audiences; these incorporated existing materials, films, and brochures. In their opinion, effective community education combines various methods: lectures, group discussions, training, and mass media.

Organizing a community speaking effort requires motivation, time, energy, and, above all, perseverence. Expect offers to be turned down frequently. Several tips may help:

- Refer to a community leader when contacting organizations; having even one reference is helpful.

- Make the initial contact in person.

- Dress professionally. Personal appearance influences first impressions and word spreads quickly among community leaders.

- Mention something relevant to the organization during the first contact (e.g., their sign at the town limits).

Key organizations to contact for initial assistance include:

- **Town Council and Chamber of Commerce**—Inform them about the program and ask for a place on their meeting agenda. It may take up to six months to be put on the agenda. Getting a local person to sponsor the speech can facilitate this process; many town councils prefer community residents on their agendas. Participating in a town meeting is a good way to publicize the program and open doors for subsequent presentations.

- **Schools**—Contact the superintendent to gain support for introducing the program in school. Working within the school system establishes credibility in the community. The principal also can suggest active parents and PTA members who might help.

- **Libraries**—Meet the librarian. Librarians tend to know what is going on in the community and may produce a newsletter, post announcements, or distribute materials. The librarian can be a useful reference when calling other community members.

- **Girl Scouts**—Call the State chapter of the Girl Scout Council of America to obtain names of local leaders.

Also contact the community resource departments in hospitals, YWCAs, YMCAs, boards of health, and local State agency offices. Community Bulletin Boards and local event announcements in newspapers are good sources of community leaders' names.

When speaking before a community organization, follow these scheduling and presentation guidelines:

- Stress that services and materials are free. Massachusetts staff found people feel threatened and do not listen if they think they will have to pay for services or information.

- Use terms like "health education" and "injury prevention" rather than the term "accident." Massachusetts staff said people identified accidents with child abuse.

- Emphasize flexibility and willingness to meet the organization's schedule. Most groups like a 45 minute to one hour program.

- Schedule the presentation around a pre-existing meeting, rather than calling a meeting just for the presentation.

- Gear the presentation toward the specific group and encourage audience participation.

- Followup immediately with everyone who expresses interest.

- Be willing to give presentations to small as well as large groups.

For monitoring purposes, Massachusetts staff filled out a community event summary report at the end of every presentation. Report items include: date and time, location, audience count, purpose, activities, outcomes, follow-up necessary, comments, and number and type of materials distributed.

6. EDUCATION THROUGH THE MEDIA AND PUBLIC RELATIONS

More than the educational interventions described thus far, media and public relations efforts can reach a large number of people with injury prevention messages. The challenge lies in learning to use these channels effectively. Media and public relations efforts can have three focuses: promoting the program, increasing awareness of the injury problem, and educating the public. The following discussion addresses the educational uses. Later Chapters discuss publicizing the program, per se.

(1) Broadcast Media

Radio and television (broadcast media) can communicate with many people who might not be reached otherwise and can reinforce prevention messages already received by parents through school, businesses, and health care providers. Use broadcast media in three ways:

- Pay for air time for prevention messages
- Convince stations to run prevention messages as public service announcements (PSAs)
- Participate in talk shows about prevention topics

When deciding which media to use and how best to use it, consider these suggestions:

- To reach specific types of parents, choose radio, because radio stations cater to specific and fairly limited segments of the listening population. For instance, to reach Hispanic parents, choose a Spanish language station. To reach young middle class mothers, advertise during the morning on a light rock station. This precision is not possible with conventional television; however, special interest channels focusing more narrowly are beginning to appear with the advent of cable television.
- If possible, buy air time rather than rely on public service announcements. Purchasers of air time can choose listener demographics (e.g., age/sex/education and income levels) and message frequency. Even though stations are required to make a specified amount of time available for PSAs, they may not allow free customers to choose the time slot or message frequency. Moreover, customers who pay for time might have leverage in convincing the station to run other PSA spots. The California project bought 18 radio spots from a local radio station which then agreed to run 18 PSAs.

- If financial resources are limited, choose radio over television. Radio time is cheaper and allows frequent repetition, which contributes to effectiveness. In contrast, an entire media budget can be used on a single television ad.

- Participate in as many talk shows as possible. Brief PSAs and paid advertisements rarely can convey rich information. During talk show appearances, however, more complex ideas can be expressed. TV talk shows, in particular, offer an opportunity to model recommended behavior and to display safety supplies, look-alike products, ipecac, etc. Virginia staff appeared on local television programs several times. In some areas, cable television stations may develop whole programs around a prevention theme.

These tips may be useful in designing a broadcast media message:

- Communicate only one idea at a time.

- Use simple language.

- Have a respected organization or person sponsor or deliver the message.

- Tailor the message language and style to the anticipated audience.

- Make the content timely—e.g., seasonal hazard warnings, Poison Prevention Week tips.

- Become familiar with the station's requirements concerning announcement format and length.

For example, during Poison Prevention Week the Massachusetts Poison Control System developed a press kit for radio stations containing:

- Points to cover in interviews (e.g., what to do in a poisoning emergency, actions that may prevent poisonings in the home)

- Background facts and information about the poisoning problem

- Sample questions for interviewers

- Three 10-second and four 30-second PSAs; a sample of each is given here:

  - POISON?????.....DON'T WAIT....CALL THE MASSACHUSETTS POISON INFORMATION CENTER FOR IMMEDIATE HELP...FROM ANYWHERE IN MASSACHUSETTS, 24 HOURS A DAY, CALL _____.

- DETERGENTS, PESTICIDES, PERFUMES...SHAMPOOS, BLEACHES, AFTER SHAVES...DO YOU KNOW HOW MANY HOUSEHOLD PRODUCTS COULD POISON YOU OR YOUR CHILDREN? THE MASSACHUSETTS POISON INFORMATION CENTER CAN TELL YOU WHICH AND HELP YOU POISON-PROOF YOUR HOME. SEND A STAMPED, SELF-ADDRESSED BUSINESS SIZE ENVELOPE TO: POISON, 300 LONGWOOD AVENUE, BOSTON 02115. NINETY-TWO PERCENT OF THE CHILDREN ACCIDENTALLY POISONED LAST YEAR WERE IN THEIR OWN HOMES. POISON-PROOF YOURS!

Finally, **establish personal relationships** with station personnel, especially if planning to request PSAs. Chances for success are greatly increased by talking directly to the Public Service Director. Make periodic visits, send materials often, and keep the program visible so it can compete well with other programs for PSA time.

(2) Print Media

Local newspapers can publish injury prevention information in several locations: feature articles, editorials, doctor's columns, and consumer information articles. Print media can communicate much more detailed prevention information than broadcast media and, in general, are free.

Articles can be written by project staff or reporters. The California project, whose newspaper articles were written by both project and newspaper staff, found that, project staff articles were more accurate but that newspaper staff articles had more credibility and publication priority. Editorials usually are written by newspaper staff. However, Massachusetts project staff found that some newspapers will accept editorials related to recent local news events. An editorial calling attention to the problem of childhood injuries and supporting the program can be a good kick-off.

In writing or suggesting content for articles, these recommendations might help:

- Tie content to a community concern—e.g., a recent house fire, the number of local children poisoned last year.
- Analyze the local paper's format and style; an article submitted in a compatible style is more likely to be accepted.
- Submit photographs or graphics to increase the article's attractiveness.
- Establish personal contact with editors and reporters; creating interest among staff may generate an offer to write articles or secure publication for submitted articles.

The California project newspaper campaign included seven articles; one, prepared by a reporter, was a three-part feature on burns, poisonings, and head injuries. After the series, California staff submitted new articles every four or five weeks. These articles featured the pharmacy effort, supermarket participation, ipecac, and Poison Prevention Week. An editorial about the project also was published. The Massachusetts project succeeded in publishing over fifty articles in about a year. Most focused on describing project activities, rather than on educating the public about prevention techniques.

(3) Public Relations Activities

Public relations activities concerning injury prevention can take many forms. The California project's participation in health fairs served a number of purposes: identified the project as a community effort, promoted good relations with other community health agencies, obtained exposure and publicity for the project, and supplied mothers of children up to four years old with injury prevention literature. A portable, reusable booth displayed prevention messages and the project logo. Staff, wearing project tee shirts, handed out kits containing a brochure about anticipating, preventing, and treating injuries, a coloring book about burns, a poison center telephone label, and ipecac. They also distributed balloons carrying the project logo; these identified mothers who had already received the kit.

Community events also were used for public relations. California staff entered the Christmas parade with a float bearing the message "up, up and away—keep poisons out of reach of children." The entry won third prize and float components were reused at health fairs. Poison Prevention Week was a major effort bringing together media and public relations. It included a proclamation from the mayor, a shopping mall display, a library display, several radio PSAs, and a newspaper article.

Business help was solicited, too. A local bank ran prevention messages on its lighted display board. Restaurants donated meals to community volunteers. Helium for health fair balloons was donated by businesses.

HOSPITAL MATERNITY EDUCATION IN CHILD AUTO SAFETY

Massachusetts Statewide Childhood Injury Prevention
Project And Child Passenger Safety Resource Center,
Massachusetts Department Of Public Health

Objective: Increase the number babies leaving the hospital in infant car seats by training health professionals: (1) to inform parents concerning dangers of unrestrained travel and (2) to motivate them to purchase or rent crash-tested child restraints.

Population At Risk: Newborns

Audience: Hospital personnel with access to maternity patients including physicians, nurses, childbirth educators, and health educators.

Background: An in-hospital training program for health professionals encouraged maternity patient education about child auto safety. The intervention was based on three assumptions: (1) that health professionals effectively can reinforce the need for child restraints, (2) that parents are particularly receptive to learning baby care in maternity settings, and (3) that hospitals can ensure car seat availability in gift shops and through rental programs.

Design: The design incorporated a hospital survey, in-hospital training, and technical assistance. First, maternity hospitals were surveyed to learn:

- Current child auto safety education activities
- Amount of time spent on child auto safety education
- Educational activities and materials
- Child auto restraint loan program activity
- Interest in receiving training

Second, hospital personnel were trained using standard curriculum. The training session outline covered the following topics:

- Professional responsibility for providing auto safety information as a preventive medicine component

- A problem statement, including statistics citing auto accidents as the leading cause of death for children under five
- Auto safety program goals and the advantages of providing education during a maternity stay
- Purpose and basic types of child restraints
- Criteria for evaluating and considerations in buying child restraints
- Guidelines for correct use
- Integrating child auto safety into hospital health education programs
- Follow-up program suggestions for health professionals and community outreach workers

Training included exercises, car seat demonstrations, and handouts. In a post-training session exercise, participants planned next steps in developing a program. Certificates were given for completing the course.

Technical assistance was provided to hospitals for establishing child auto safety education and car seat loan programs. Educational materials and health fair displays also were distributed on request.

Materials: Training and technical assistance materials included:

- Child auto safety hospital survey
- Child auto safety curriculum outline for in-hospital training of health professionals
- Post-training session exercise and answer key
- Participant award forms (for RNs and other participants).
- A "Family Shopping Guide To Infant/Child Automobile Restraints" (xeroxed handout)
- Car restraints for demonstrations
- Films and audio-cassettes
- Brochures and pamphlets

Implementation: Implementation required at least one knowledgeable health educator. This health educator discussed program adoption with the hospital administrators and conducted training sessions. The following advice was offered about approaching hospitals:

- Contact the highest possible hospital administrator
- Persuade the hospital that participating is in their best interest; the Chief of Pediatrics can be a valuable allay.
- Agree on mutual expectations at the beginning

Many car seat loan programs were established after the training. One year later, a second child auto safety survey was sent to target community hospitals. Results showed an increase in infants leaving the hospital in car seats and increase the amount of time spent on child auto safety counseling.

Comments: The detailed outline and inexpensive handouts make this intervention easy to replicate, if training staff are available. The intervention was well-received by the large percentage of participating institutions.

ANTICIPATORY GUIDANCE IN PRIMARY HEALTH CARE SETTINGS

California Childhood Accident Prevention Project

Objective: Access mothers of children through four years in primary health care settings and instruct them in prevention messages.

Population At Risk: Children through four years.

Audience: Mothers

Background: This anticipatory guidance approach involved training health care providers to counsel and distribute materials in various settings. Settings included private pediatrician and general practitioner offices, public health department clinics, and community clinics.

Design: The intervention aim was to integrate prevention counseling into the daily routine of health care providers; therefore, participants formulated their own plan within the following basic protocol:

- Providers display posters in waiting and examining rooms.
- Providers discuss accident prevention after the well-baby visit and distribute a materials packet and an age-appropriate guidance sheet.
- Providers stamp "Accident Prevention Discussed" on the chart to reinforce prevention information importance and to track counseled patients.

Materials: A pre-packaged materials packet, posters, a rubber stamp, "Accident Prevention Discussed," and age-appropriate anticipatory guidance sheets were designed. The materials packet included:

- "Prevention Is No Accident" brochure containing information on prevention and first aid for poisoning, burns, and head injuries
- "What's Hot in Our House?" burn prevention coloring book
- Poison Center telephone sticker
- Ipecac

Photographic posters featured children and simple messages like:

- Your Child Depends on You for Safety
- Up, Up, and Away—Keep Medicines Out of Reach
- A Question About Poisons?—Regional Poison Center 294-6000

Color-coded anticipatory guidance sheets contained age-appropriate information on poisonings, falls, burns, and moter vehicle accidents. Sheets were targeted to the following age groups: birth to six months, seven to 12 months, one to two years, and two to three years.

Implementation: Approximately 20 private pediatricians and two community based clinic staffs participated. Inservice training acquainted each group with overall program objectives. Implementation was monitored through telephone calls and surprise visits.

Comments: Participants incorporated prevention counseling with varying degrees of ease. Pediatricians most easily integrated the counseling; family practitioners found their patient population of young children smaller than expected. Community clinic health aides found counseling more difficult; these clinics had a large proportion of sick-baby visits. Both clinics experienced high personnel turnover; periodic retraining would have been helpful. Materials were well-received, particularly the anticipatory guidance sheets, ipecac, and the poison center telephone sticker. Posters were used in clinics, but not in more formally decorated private offices. The "Accident Prevention Discussed" stamp was used rarely.

PEDIATRIC ACCIDENT PREVENTION PROJECT (PAPP)

Massachusetts Statewide Childhood
Injury Prevention Project

Objective: Provide a developmentally-oriented, focused counseling system for pediatric primary care settings.

Population At Risk: Children through five years

Audience: Parents coming to physician's office for a well baby visit or receiving a visit from public health nurse

Background: A pediatrician at Framingham Union Hospital in Massachusetts developed this anticipatory guidance approach and further refined it with the Massachusetts project. Approximately 20 pediatricians and general practitioners and three public health nurse groups participated. Over a 22 month period, 1,437 parents having a combined total of 2,424 children were counseled in urban, suburban, and rural communities.

Design: A pre-counseling questionnaire directed physician time to high risk topics. Steps involved were:

- The nurse or receptionist distributes an age-appropriate Framingham Safety Survey (FSS) and instructs parents about how to answer the questions.
- Parents, answer a series of multiple-choice questions addressing safety issues in areas of: general household hazards, poisons, burns, water hazards, vehicular hazards and toy safety; wrong answers are automatically recorded on the second page of the questionnaire by a specially designed carbon transfer.
- The physician or public health nurse (whoever is doing the counseling, hereafter referred to as "counselor") counsels parents only on items about which lack of knowledge puts their children "at risk." Counselors also display safety supplies and handout samples and targeted printed materials.

Materials: Counselors used a combination of materials:

- Three safety surveys--one for children less than nine months and two for children nine months through five years
- A provider manual that explains how to use the safety surveys, provides counseling tips, and references appropriate handouts
- An accordian file containing 19 brochures and stickers arranged by hazard type
- Posters and signs
- A safety supply board displaying shock stops, ipecac, cabinet locks, kindergards, and outlet covers as well as samples for distribution

Implementation: Implementation experience showed:

- Physician counseling alone averaged slightly over three minutes; total patient time (for the questionnaire and counseling) averaged approximately seven minutes.
- Physician office staff needed periodic retraining because of high turnover.
- Materials cost and physician stipends ran $2.50 per child for the pilot test.
- Parents ranked the following materials as most valuable:
  - Poisonous plant handout
  - Poison center telephone sticker
  - Window sticker identifying child's room in case of fire
  - Safety supplies, especially ipecac

Comments: Physicians and public health nurses generally were receptive; however, certain individuals or groups were more committed to counseling than others. All pediatricians received continuing education credits from the American Medical Association as an incentive.

ONE-TO-ONE COUNSELING WITH REINFORCEMENT

Virginia Childhood Emergency Control Center Project

Objective: Provide initial counseling and periodic reinforcement of simple prevention messages.

Population At Risk: Children through four years

Audience: Mothers or primary caretakers

Background: This anticipatory guidance approach tested the value of simple messages reinforced over a year. Project staff counseled parents in health clinics in Charlottesville and Lynchburg, and in clinics and private physician offices in Richmond. About 1,120 mothers participated in the intervention.

Design: Counselors discussed accident prevention with mothers during well-baby visits. Counseling was based on a script containing prevention messages and directions for the counselor. Three scripts were prepared—one for poisons only, one for burns only, and one for poisons and burns (described below). The physician and periodic mailings reinforced messages. The intervention process is outlined below:

- The counselor meets the mother either **before** her well-baby visit, or is introduced by the physician **after** the appointment.
- Next, the counselor asks questions on injury incidence and first aid for poisonings and burns.
- Then, the counselor delivers a prepared script focusing on household hazard awareness and first-aid knowledge. The script allows much interaction between counselor and mother. Dangerous look-alike products, (one harmless, one poisonous) are displayed. Sample pairs included soft drinks/radiator fluid and breath mints/vitamins. Safety supplies, like kindergards, also are presented. At appropriate points the counselor hands out burn and poison hazard checklists, ipecac, and Mr. Yuk stickers.
- The counselor flags charts to remind physicians to reinforce prevention messages during the appointment.

- After one month, the counselor mails a letter restating key messages and containing additional prevention materials.
- After eight months, the counselor mails another letter containing the basic hazard checklist distributed during the original counseling session.

Materials: Materials were original except for items borrowed from Project Burn Prevention and the Mr. Yuk program. Materials included:

- Step-by-step guide to the initial counseling visit
- Three counseling scripts: Burns, Poisons, and Burns and Poisons
- Burn Hazard Checklist and Poison Hazard Checklist
- Poison Prevention Tips from Mr. Yuk and poison center telephone sticker
- Ipecac
- Poison Plant Guide
- "Protect Someone You Love" (booklet)
- First Aid for Burns
- Hot Spots (warning stickers for hot surfaces)
- Seasonal hazards sheets for spring and summer, winter, and Christmas
- Pictures of children in dangerous situations
- Look-alike product pairs
- Flags for physician charts

Implementation: Lessons learned included:

- Schedule the counseling session as a formal part of the appointment. Counselors often were interrupted when the physician was ready to see the patient. Counseling was difficult to resume because mothers were anxious to leave.

- Tailor scripts to the audience educational level. These scripts were designed for a fourth-grade level and worked well in clinics but not in private offices.
- Use visual aids. Pictures, product samples, and handouts encourage interaction. Interaction allows the counselor to assess the mother's comprehension.
- Counsel only during well-baby visits and, if possible, with the child absent.
- Shorten the combined poison and burn script. Individual poison and burn scripts took about seven minutes; the combined script required 25 minutes.
- Do not disturb the normal routine of medical personnel.

Comments: This approach to anticipatory guidance consumed significant amounts of project resources. Physicians were unwilling to deliver the script, so project staff did all the counseling. Volunteer counselors may offset some cost. Physician enthusiasm varied by site. In most cases physicians and nurses did not reinforce prevention messages.

PRESCHOOL PREVENTION PROGRAM FOR PARENTS

California Childhood Accident Prevention Project

Objective: Access mothers of preschool children and instruct them in accident prevention techniques.

Population At Risk: Children through four years

Audience: Parents of preschool-age children

Background: Preschool teachers were asked to deliver prevention messages because of their interest in children and their credibility with parents. Prevention information can be incorporated easily into parent-teacher conferences. The three preschools chosen for the test phase represented low-income, middle-income, and upper-income families.

Design: This intervention design was simple:

- Preschools display posters conveying prevention messages
- Teachers reinforce messages in open-house discussions with parents and regularly scheduled parent workshops
- Teachers handout packets containing anticipatory guidance sheets, poison control center telephone stickers, a coloring book, a brochure, and a materials opinion questionnaire
- Preschool staff distribute free ipecac to parents who return the questionnaire

Materials: A few basic materials were developed:

- Photographic posters featuring children and injury prevention messages
- Pre-packaged kits contained:
  - Age-appropriate anticipatory guidance sheets
  - "Prevention Is No Accident," a brochure describing prevention and first aid for burns, falls, and poisonings

- A poison center telephone sticker
- "What's Hot in Our House" burn prevention coloring book

Implementation: After some difficulty, a list of preschools was obtained through a YMCA childcare resource service. One preschool director acted as liaison to gain support and cooperation of preschool teachers. The liaisor arranged an inservice teachers training, provided information to participating teachers, and served as a spokesperson.

Comments: Preschools can be an effective delivery system for accident prevention education. This easy-to-implement intervention was well received by teachers and parents. The preschool liaison felt that a formally organized preschool group could facilitate adoption. If no organization exists, the liaison suggested visiting each school personally before scheduling an inservice training.

PROFILE 6(1)

EDUCATION
(Preschool)

POISONING PREVENTION EDUCATION FOR PRESCHOOLERS

Virginia Childhood Emergency Control
Center Project (Richmond)

Objective: To increase children's awareness of hazards in taking medicines without parental guidance

Population At Risk: Children three through five years

Audience: Children three through five years

Background: In response to requests, a poisoning prevention presentation was developed for day care centers and kindergartens. The presentation emphasized medicine because poison center data indicated it was the most common poison ingested by preschoolers. Poisonings were believed to result from pre-schoolers' inability to understand the concept of dosage. To test this hypothesis and develop the presentation theme, a study was conducted to determine whether children perceive their own medication as harmful. Do they understand that something can be good and bad at the same time? Eight three-and-four-year-olds were seated before four items—a cleanser, a bottle of vitamins, a bunch of grapes, and a package of candy. They were asked three questions:

- What was each product's name?
- Would it be OK for you to eat one of these (or some of this)?
- Would it be OK for you to eat all of these (or all of this)?

Results showed that three and four year olds differ in cognitive ability. At three years old, 60 percent of the children knew cleanser will make you sick, but only 30 percent realized medicine is dangerous. At four years old, 80 percent recognized both cleanser and a whole bottle of vitamins can make you ill. Therefore, the presentation stressed that you should always ask Mom or Dad before eating or drinking anything.

Design: The intervention was aimed primarily at children, with parents as a secondary audience. The design had three simple components:

- A children's slide show that stresses asking permission before eating or drinking anything, introduces the child to Mr. Yuk, and explains the poison control center telephone number.

- Materials for teachers and parents.
- Teacher follow-up activities for the classroom.

These tips may be helpful when designing a similar program:

- Accommodate children's need for variety and short attention spans.
- Present the slide show to small groups; smaller groups were more receptive than larger groups.
- Consider excluding Mr. Yuk if the Yuk program is not part of the local poison center. Virginia project staff believe that Mr. Yuk confuses preschool children because they cannot understand how something can be good—warn of danger—and bad for at the same time.
- Discover ideas for teacher follow-up in "A Guide to Teaching Poison Prevention in Kindergartens and the Primary Grades;" the guide was written by the South Carolina Board of Health under an HHS grant.

Materials: Materials were simple and inexpensive. They included:

- A 20 minute scripted slide presentation
- Mr. Yuk song record played during the slide show
- Three posters for classroom display
- Mr. Yuk stickers with the Poison Center telephone number
- A safety checklist identifying poisonous household hazards for parents
- A poisonous plant list for parents
- Instructions for teacher follow-up activities including a safety scrapbook and a song, "We Ask First"

Implementation: Between March 1981 and June 1982, the intervention reached approximately 1,300 children. Junior Women's Club members were trained to give the presentation in their own neighborhood. A hospital pharmacist presented the program to kindergarten and first-grade classes.

Comments: The intervention was well-received. The Virginia Pharmaceutical Organization adopted the intervention.

POISON PREVENTION CAMPAIGN THROUGH RETAILERS

Massachusetts Statewide Childhood Injury Prevention Project
Massachusetts Poison Control System
Massachusetts Society Of Hospital Pharmacists

Objective: Reduce the number of accidental poisonings among children under five, promote the use of syrup of ipecac, and publicize the poison control center.

Population At Risk: Children through five years

Audience: Parents and siblings of children through five years

Background: This intervention involved retail establishments in distributing poison prevention information. Over three years, pharmacies, supermarkets, and hardware stores were enlisted; one year, florists were recruited as well.

During Poison Prevention Week in March 1982, pharmacy activities were combined with an intensive community outreach program and media effort. Parents and siblings of children under six formed the target audience; in previous years grandparents also were targeted. Thirteen pharmacies in 10 towns actively participated during that week. Later that spring, five supermarkets agreed to distribute information.

Design: During the three years, two program components evolved: (1) distributing prevention information and ipecac and (2) sponsoring a poster design contest for school children. Design elements from all these campaign years are combined in the following protocol:

- Local pharmacies display posters for ipecac and give out pamphlets; supermarkets hand out pamphlets only.
- Pharmacists counsel parents and grandparents about ipecac. Pharmacists may give out ipecac or sell it at cost.
- Pharmacists distribute Poison Control Center stickers and explain about poison control system services.
- Pharmacists also counsel customers about the necessity for child resistant caps and the proper storage of medicines.
- Florists hand out poisonous plant pamphlets.

The poster design campaign was co-sponsored by the Title V project and participating pharmacies. Children in kindergarten through second grade submitted entries on the theme "How To Make Sure I Am Not Poisoned." These children are also young enough to require help, thereby educating their parents as well. Teachers received a copy of "A Guide to Teaching Poison Prevention to Kindergarten and Primary Grades V" to help their children with the posters. First place winners, and their parents and teachers received ribbons, toured a local hospital, and saw a poisoning prevention film. Prize winning posters were displayed in the pharmacies.

This intervention was publicized by:

- Newspaper articles
- Public service announcements on radio stations
- Announcements on a bank's electronic message board

Materials: In some cases, participating pharmacies were cited by name. Various media, particularly printed materials, were employed:

- Letters to pharmacies and florists' shops explaining the campaign and offering counseling tips
- Poison Control System telephone stickers
- Counter-sized ipecac display posters
- Ipecac
- Pamphlets:
  - "Poison-Proofing Your Home"
  - "Poisons in the Home"
  - "Poisonous Plants"
  - "Poison Prevention Packaging—Alternatives for Older Consumers and the Handicapped"
  - "Poison Prevention Packaging—What Pharmacists Should Know"

- "A Guide to Teaching Poison Prevention to Kindergartens and Primary Grades," developed by the consumer Product Safety Commission
- Ribbons awarded to poster contest winners

Implementation: Before implementing the campaign a mail survey and site visits were conducted to determine existing poison prevention promotion. Retail stores were recruited by letter during the initial year and by telephone in later years.

A hospital pharmacist played a leading role in organizing the 1982 pharmacy and poster campaigns. The stores were visited regularly to distribute materials and note if an ipecac display was visible. Pharmacies requested additional literature during the campaign.

Comments: The campaign expanded over the years. Pharmacists were especially enthusiastic and intend to broaden the 1983 campaign. Supermarkets participated to a lesser extent, distributing pamphlets, but not displaying posters. Supermarket chains had restrictive policies on store displays. Florists viewed poisonous plant information as having a negative effect on business; thus, they were unwilling to distribute materials.

PROFILE 8(1)

EDUCATION
(Public)

SUPERMARKET DISTRIBUTION CAMPAIGN

California Childhood Accident Prevention Project

Objective: Remind parents of young children to store toxic materials out of reach and reinforce prevention messages in the general community.

Population At Risk: Children through four years

Audience: Parents shopping in supermarkets

Background: Supermarkets were tested as a distribution channel for prevention messages because mothers regularly patronize them. The intervention assumed that mothers, seeing toxic products reshelved, would carry that practice into their homes. This conviction was reinforced by a similar project success in New York State.

Design: The intervention design involved store participation in three areas:

- Store personnel reshelve toxic products out of small children's reach and display signs next to these products that reinforce the safe storage message.
- Stores display posters throughout the stores. Posters can be hung from ceilings, placed in windows, or supported in T-stands. Health educators or supermarket staff rotate the signs regularly.
- Checkers use bags printed with prevention messages.

Materials: The supermarket campaign relied on these printed materials:

- "Dear Shopper" signs noting that toxic products had been shelved out of children's reach and encouraging similar home storage procedures
- Posters reinforcing general prevention information and safety
- Shopping bags printed with safety messages

Implementation: Because most supermarkets are part of chains, preparation involved obtaining agreement from several management levels. The intervention was implemented as follows:

- Lists of supermarket chains were compiled and district offices were contacted by telephone.

- Meetings were held with district managers during which project materials were displayed, background information provided, and implementation discussed.

- District managers provided local store manager names; local managers were responsible for implementation.

- Meetings were held with local managers during which procedures were discussed and adaptations made to individual store requirements.

- Materials were delivered to the stores. Displays and reshelving were noted. In some instances suggestions to increase the effectiveness of displays were offered.

Comments: Although all stores participated, involvement and enthusiasm varied greatly. Most stores displayed the posters and labelled toxic products, but did little reshelving. Reluctance to reshelve toxic products was attributed to the rigid schematics under which chain stores operate. Most managers would continue to participate as long as their own input was minimal.

An in-store survey was conducted to assess consumer reactions; only 11 percent of shoppers noticed the signs. Four hundred households surveyed on the other hand, ranked supermarkets fifth out of a possible 15 prevention information sources.

TECHNOLOGY

Technological interventions involve (1) developing and promoting methods to restrict the release of what Haddon calls the agent (the actual cause of the injury) and (2) improving the emergency response to injuries that do occur. For instance, two technological responses to aspirin poisoning might be: limiting the number of pills in a bottle to below the fatal dose and having a well-publicized poison center hotline available to provide early treatment.

Unlike educational interventions, which always require human behavior change, technological interventions can be passive (e.g., they require no parental participation). Interventions that do not depend on modifying daily behavior tend to be highly effective. Packaging aspirin in bottles containing less than a fatal dose might well prevent more poisonings than encouraging parents to keep aspirin out of reach. Yet implementation of most technological interventions also relies on laying an adequate educational groundwork. Drug companies must be convinced of the need to package aspirin in limited numbers. Parents must be persuaded to buy smaller, safer bottles. And parents must be aware that early treatment is available from a poison control center.

Motivation and support for technological interventions can come from four sources:

- Consumers whose children were or might be injured
- Health care providers or scientists who see technical solutions to problems
- Business people who see the marketability of technological interventions
- Lawers who see technical interventions as in the public interest

When contemplating a technological intervention, canvass each source to assess interest and enlist aid. The first thrust can be promoting voluntary development and adoption of prevention technology. If voluntary action does not result, resort to legislative and regulatory measures to mandate compliance (government action interventions are discussed the next section). This section discusses four types of technological prevention interventions:

- Creating safe recreational and living areas
- Designing and promoting safe products
- Developing and promoting safety equipment
- Establishing emergency response systems

1. SAFE RECREATIONAL AND LIVING AREAS

Many injuries are caused by design defects in furnishings and equipment or by natural hazards in the physical environment. A program can organize voluntary action to correct these problems, as suggested in the following paragraphs.

(1) Recreational Areas

Falls from playground equipment and drownings in local pools may be reduced by assessing and then modifying physical hazards that contribute to such injuries. The New York State Department of Health and the Consumer Product Safety Commission identified playground safety hazards such as hard surfaces and sharp equipment edges and encouraged responsible parties to correct them voluntarily. The intervention had three components: educational seminars for playground supervisors and authorities, volunteer assessment of playground hazards using a 12-point checklist, and a general public awareness campaign of playground hazards. (See Profile 9) Health agencies can promote pool safety by encouraging fencing, warning signs, and resuscitation equipment in municipal pools.

(2) Living Areas

Architects can design more accident-proof homes through two strategies:

- **Home Safety Ratings**—Rate architects and homebuilders on the safety of their houses to identify homes that are relatively hazard free.

- **Research Safety Homes**—Work with architects and homebuilders to design and construct demonstration homes containing safety features such as railings, proper illumination, soft floors, and fire detection devices. The Child Resource Centre of Melbourne, Australia has a "Safety Kitchen" on display. Donated by a number of companies, the kitchen features rounded corners, a poison cupboard with a special latch, a stoveguard, wool curtains, and switch protectors.

Some remedies for design defects in homes are within parents' control; other remedies must be taken by landlords or local government authorities. Building superintendents can be trained to identify safety hazards. Tenant associations can be trained to assess building safety and then encourage owners and superintendents to correct deficiencies. For example, the Children Can't Fly campaign of the New York City Health Department successfully promoted installation of bars to prevent children from falling out of windows (Center for Disease Control 1981b).

2. SAFE PRODUCTS

Passive prevention technology can be fostered by convincing manufacturers to modify potentially hazardous products voluntarily and by promoting voluntary use of safe products. Recently, for example, a consumer parents group influenced fast food chains to stop giving away toys with small parts that children could swallow.

The New York State Department of Health, Public Education Unit resolved consumer complaints about an unsafe candle by:

- Contacting the candle distributor; the distributor stopped sales.
- Telephoning the manufacturer; the manufacturer contacted the CPSC.
- Asking retailers to sponsor a recall campaign; the State agency used newspapers, television, and radio to ask consumers to return candles to stores (Fisher 1976).

Voluntary action can be inspired by rating or publicizing products that reduce a child's risk of injury. For instance, cribs can be rated regarding slat spacing, headboard design, ornamentation, and finish. Keep up with unsafe products through Consumer Product Safety Commission mailings; this information may generate intervention ideas. Other ideas for encouraging improvements in product safety are discussed below, by injury type.

(1) Burns

Product modification can play an important role in decreasing burns. In Massachusetts, flame burns from ignited clothing were dramatically reduced when nonflame resistant children's sleepwear was prohibited by law. In Denmark, children were receiving electrical burns by chewing a defective vacuum cleaner plug. The manufacturer agreed voluntarily to exchange all plugs free of charge and the press widely advertised this offer. After the 20,000 plugs were exchanged, mouth burns from this cause were virtually eliminated (Baker 1981).

Current technology can help reduce other burns as well. Hot water scald burns would decrease if hot water heater, dishwasher, and washing machines manufacturers lowered the maximum temperature to 120-130 degrees. Detergent manufacturers could cooperate by selling products that work at lower temperatures. Automatic passive control devices control the introduction of hot water in the shower or bath. Scald burns from hot foods such as coffee and grease can be lessened by more stable cookware. Self-extinguishing matches reduce flame burns.

(2) Poisons

Many measures to prevent poisoning are already in use. Childproof closures on regulated products have reduced emergency room visits associated with such products by 35 percent, compared to a 20 percent increase in poisonings by nonregulated poisonous products (Baker 1981). Consumers can urge manufacturers of nonregulated poisonous products to voluntarily use childproof containers. Restricting the amount of medicine in a bottle to below the fatal dose for children can reduce the severity of poisonings.

(3) Asphyxiation

Deaths and injuries from choking and suffocation can be caused by such commonplace products as hot dogs, plastic bags, and children's furniture. Preventive measures to reduce asphyxial deaths include:

- Manufacturing flat rather than round hot dogs
- Using porous materials in plastic bags
- Including a ring or disc in balloons to prevent aspiration
- Designing pacifiers so that neckcords can not be attached.
- Using breakaway closures on children's clothing, particularly at the neck

The CPSC already has set minimum dimensions for pacifiers, rattles, and toy parts. Cribs slats cannot be less than 2 3/8 inches apart, rough edges are not permitted, and locks and latches must be a childproof. Yet certain cribs still have features, like the crib headboard or playpen railings, in which a child's head can get caught. Some railings, called teething rails, are made of soft materials that children can bite off and swallow. Consequently, warning parents of such hazards may be an effective intervention.

(4) Contusions, Cuts, And Abrasions

Finally, manufacturers and parents can be educated about toys and furniture components that can cause cuts and scrapes. Projectiles like toy guns and plastic missiles can injure eyes and other body parts. Household furniture with sharp edges and glass tops should be avoided or replaced.

3. SAFETY EQUIPMENT

Another technological approach to injury prevention involves designing and promoting safety equipment that has been developed to prevent or minimize injuries. Examples include:

- Electrical outlet covers
- Childproof drawer and cabinet locks
- Toddler gates placed at the head and foot of stairs
- Child auto restraints
- Smoke detectors
- Fire extinguishers
- First-aid kits
- Syrup of ipecac

Programs can publicize safety equipment to the general public, enlist health professionals to promote its use, encourage retailers to stock supplies, and solicit, publicize, and even fund ideas for new safety equipment. For instance, the Australia Child and Home Safety Centre is sponsoring development of stove guards that prevent children from pulling saucepans off the stove.

4. EMERGENCY RESPONSE SYSTEMS

Emergency response systems provide early treatment and patient triage services for acute illnesses and injuries. To date, great strides have been made in training ambulance staff, equipping ambulances, establishing the 911 emergency number, setting up regional injury centers (e.g., trauma and burn), and implementing regional injury hotlines.

Injury hotlines provide telephone treatment, followup, and hospital referral. Most major metropolitan areas and in many less populated areas have poison hotlines. Most are affiliated with major hospitals and serve the entire State or a large region. Many poison centers also provide consultation, professional education, and community education. All three demonstration projects used existing poison centers to deliver hotline and other prevention services. For more information on poison centers, see **A Guide to Developing Regional Poison Systems** (Micik 1981).

The Virginia project developed and implemented a Burn/Bump Hotline. The objectives were to: increase the number of burn cases treated in hospital emergency rooms, consequently lessening the chances for later infection and scarring; and decrease the number of inappropriate emergency room visits for head injuries (bumps). Hotline staff used a telephone protocol to determine injury extent and nature; callers whose children required immediate treatment were directed to the emergency department; others were told to watch for certain signs and call back at regular intervals.

Services were targeted only to families with children under five who did not have a regular health care provider. Hotline availability was publicized through posters displayed in stores, laundromats, and clinics, and in radio PSAs and newspaper articles. Telephone stickers featuring the hotline phone number and burn/bump facts sheets also were distributed.

CHILD PLAYGROUND INJURY PREVENTION PROJECT

New York Department Of Public Health
Consumer Product Safety Commission

Objective: Prevent playground-related injuries by increasing awareness of potential hazards.

Population At Risk: Children through 14 years

Audience: Professionals involved in purchase, installation, maintenance, and supervision of public playgrounds

Background: Falls are a predominant playground injury; in 1978, the Consumer Product Safety Commission estimated that about 155,500 playground-related injuries required an emergency room visit. Because of numerous nonequipment-related factors of playground safety, mandatory equipment standards alone are inadequate. Hazards include hard playground surfaces, heavy swing seats, and sharp metal corners on equipment. A program to identify these factors and encourage voluntary correction of playground hazards was pilot tested in three counties during 1977-78.

Design: The Child Playground Injury Prevention Project had three main design components: educating playground professionals, assessing local playground hazards, and increasing playground hazards awareness. Each component is explained below.

- Professionals involved in the purchase, installation, maintenance, and supervision of public playgrounds are trained in a standard 40 minute seminar. The seminar features materials about possible hazards and low-cost correction techniques, a film, and pre-and post-tests measuring changes in participant knowledge. Participants may come from daycare centers, elementary schools, nursing staffs, PTAs, and community/recreational organizations.

Source: Fisher, L., Harris, V.G., VanBuren, J.Q., & DeMaio, A. Assessment of a pilot child playground injury prevention project in New York State. American Journal of Public Health, 1980, 70(9), 1000-1002.

- Project personnel next recruit and train consumer deputies*—unpaid volunteers from PTAs, consumer groups, teachers, etc. Consumer deputies learn about playground injuries at a half-day seminar. They participate in role-playing exercises to: (1) identify 12 easily correctable hazards using a CPSC checklist and (2) suggest voluntary corrective action to the playground personnel. The consumer deputies then visit randomly selected playgrounds, identify and record risks, and promote voluntary correction.

- Project staff increase playground hazard awareness using public service announcements, newspaper articles, and shopping center and health fair exhibits. Playground safety leaflets and coloring books were distributed at exhibits.

Materials: Materials in various media were used:

- Pre- and post-tests on playground hazards
- CPSC film "Swing That Swing Back"
- CPSC survey-checklist of 12 observable, easily correctable hazards
- Radio PSAs and newspaper articles targeted to parents who have backyard play equipment
- Public exhibits featuring quiz boards, puppet shows, and "talking" playground equipment
- Playground safety leaflets and coloring books

Implementation: The program was implemented during 1977 and 1978. Fifteen hundred playground leaders attended 30 workshops. Sixty consumer deputies surveyed 110 playgrounds operated by schools, municipalities, and State and local park systems. The surveys were repeated in 1978 to assess program impact.

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* Deputies have been used to voluntarily survey homes, retail stores, and public places for unsafe surroundings, practices, or products. Write for Fact Sheet #80, "The Consumer Deputy Program" from the Consumer Product Safety Commission, Washington, D.C. 20207

Comments: Assessment results were encouraging despite data limitations. The 1978 follow-up survey reported a 42 percent reduction since 1977 in hazards per playground site. For example, the proportion of hard surfaces found in Monroe County playgrounds declined from 71 percent in 1977 to only 26 percent in 1978. Injury frequency data was obtained from two of Monroe County's largest hospitals. A 22.4 percent reduction in playground injuries was shown when the average number of injuries was compared for July-December 1977 and 1978 and July-December 1975 and 1976.

GOVERNMENT ACTION

Government-backed injury prevention interventions mandate change through regulation and legislation. These interventions have four advantages:

- They reach and have an impact on almost everyone.
- They can institute passive measures, such as crib safety standards or childproof closures, which require little or no consumer behavior change.
- They can motivate people to change behavior through negative incentives (such as ticketing parents who do not have one year old children in car seats).
- They can be implemented by convincing relatively few government officials and legislators that injury prevention is worthwhile. (However, convincing them might require extensive public support, which usually comes after a well publicized tragedy or an educational campaign.)

The two types of government injury prevention interventions are legislation and regulation:

- Passing new **legislation** is a lengthy and complex task. Several years of committee meetings, hearings, and lobbying may be necessary before the desired legislation is passed. Therefore, before undertaking a legislative initiative, examine existing laws and regulations to uncover established paths for injury prevention activities.
- **Regulations** are guidelines for implementing legislation. They can be promulgated on the Federal, State, or local level. Sometimes regulations are specific; other times broad regulatory authority is delegated to governing bodies. For example, the Poison Prevention Packaging Act regulates specific poisonous products, while the Consumer Product Safety Commission can set standards for any product hazard it wishes to regulate. Additionally, health officials, State and local administrators, and school authorities may have the power to promulgate regulations in a defined jurisdiction. Programs can work either to encourage institution of new regulations or to encourage active enforcement of existing ones. All three options are discussed below.

1. ENFORCEMENT OF EXISTING REGULATIONS OR LAWS

Encouraging officials to enforce existing regulations or laws is perhaps the simplest government action intervention. The public and even public officials may be unaware of many safety regulations and laws on the books. Two examples illustrate injury prevention activities based on existing regulations:

- **Housing Injury Prevention Project (HIPP)**—The Massachusetts project developed HIPP to encourage local boards of health to enforce the State sanitary code and to incorporate injury prevention counseling

into housing inspections. A housing inspector, funded by the project, visited families with young children who lived in rental or public housing. During the visit the inspector examined the dwelling for compliance with the code, paying particular attention to safety factors such as proper illumination, water temperature, and window locks and screens. Next, the inspector assessed safety hazards such as storage of poisonous products, crib structure, and unused electrical outlets. When he found a hazard, the inspector counseled the parent, installed safety equipment (e.g., shock stops on unused electrical outlets), and left injury prevention information with the parent. Finally, the inspector filed a report on all code violations with the local board of health, notified the landlord of the violation giving 30 days for the situation to be corrected, and initiating legal proceedings if the violation still existed after 30 days. (See Profile 10)

- **Licensed Daycare**—The California project, in cooperation with the San Diego Department of Social Services, employed the licensing process to counsel caretakers in injury prevention. Licensing evaluators assessed safety conditions, discussed prevention techniques, and distributed prevention materials, including ipecac. They also left cards for parents to mail in exchange for prevention materials. (See Profile 11)

2. NEW REGULATIONS OR ORDINANCES

A second government approach to injury prevention involves urging authorities to implement new regulations or ordinances. On a national level, this might entail working with a Federal agency such as the CPSC; on a local level, it may mean trying to influence county government. Both national and local strategies are illustrated below.

(1) Consumer Product Safety Commission Regulations

The Consumer Product Safety Commission (CPSC) plays an important role in removing hazardous products from the marketplace. By setting standards for toy parts, crib slats, and other products, the CPSC has prevented many injuries. The Commission operates on a reactive, rather than a proactive basis. It responds to complaints and reports of injuries, but does not approve products before they are put on the market.

Anyone identifying a potential consumer product hazard can petition the CPSC to issue regulations. Petitions can be filed under Section 10 of the Consumer Product Safety Act (15 United States Code 2059). The commission is required to respond either by taking action or by publishing reasons for denial in the **Federal Register.**

Therefore, petitioning the CPSC is appropriate if manufacturers do not respond voluntarily or if a particular product surfaces as a problem during an epidemiological study. Petitions requesting action on toy projectiles and playpen teething rails currently are under review. A petition to require that new home water heaters have a maximum temperature of 130° recently was denied.

(2) Local Regulations And Ordinances

Some local governments have the authority to create regulations and ordinances. Action on a local level may be more rapid than and just as effective as the sometimes complicated State legislative process.

For example, an Albuquerque pediatrician became alarmed at the firework-related burn injuries seen in the emergency department one July 4th. After gathering preliminary data, the pediatrician formed "Citizens for Fireworks Control" (CFC) to lobby the County Commission for a stricter fireworks ordinance. CFC enlisted support from physicians, firefighters, and others; it developed cost/benefit data and information on the experience of other jurisdictions. Despite opposition from fireworks manufacturers and distributors, the County Commission restricted the availability of fireworks (Berger 1981).

Local government action interventions to control burn injuries suggested by National Injury Control Conference participants include:

- Require that residential hotwater heater thermostats have a maximum setting of 130°.
- Require installation of passive control devices on tap water faucets to keep tap water below the temperature needed to produce scalds.
- Amend the housing inspection code or fire ordinances to require that all homes (houses and apartments) have smoke detectors.
- Make home mortgages and loans contingent on installation of fire prevention devices.
- Require that public school curricula include instruction on fire and arson prevention.

Participants also proposed that drownings be reduced by safety regulations that require:

- Fencing and automatically closing gates with latches located beyond the reach of young children.
- Safety equipment in pool plans.
- Inspection by the health department when construction is completed for public and home pools; ongoing inspection for public pools (Centers for Disease Control 1981b).

The effectiveness of such regulations can be seen when the swimming pool fatality rates for Honolulu and Brisbane are compared. The two cities have similar demographics, climate, and pool/house ratios; Honolulu has and Brisbane does not have a fence ordinance. Honolulu's drowning rate is 0.9

per 100,000 compared to 2.6 per 100,000 for Brisbane. Among toddlers the difference is even more pronounced. Between 1973 and 1977 four Honolulu toddlers drowned in home pools. Over that same period, 28 Brisbane children drowned (Pearn et al. 1980).

Drownings also may be reduced by giving environmental agencies, under whose jurisdiction fall ponds, rivers, canals, and beaches, responsibility for and authority to police such areas, post signs about hazards, prohibit unsafe practices, and so forth.

3. NEW LEGISLATION

If no laws currently exist under which action can be taken or intensified, new legislation may be required. Much recently passed child injury prevention legislation concerns child auto restraints; specific examples below are drawn from this experience.

Getting a new law passed can be a long and complicated process. Generally, it involves getting support from legislators; going through committee meetings, hearings, and a series of votes; and watching the bill be modified by amendments. Legislative effort should be undertaken only on extremely important issues and when there is:

- Evidence that the bill can be effective
- Support from judges and police officers who believe that the law can be enforced
- Evidence that excessive costs will not be involved in enforcing the law
- Certainty that the law can be constitutional and compatible with existing legislation and ordinances
- Broad-based support from constituents (Berger 1981)

Political and emotional factors also can affect legislation. Be aware of potential opposition from special interest groups. Opposition often centers on financial costs of implementing the legislation and infringement of personal freedoms; be prepared to counter such arguments by publicizing statistics that reinforce savings in terms of dollars or lives.

Two examples of State laws to encourage child auto restraints follow:

- In 1978, Tenessee became the first State to pass a mandatory child auto restraint bill. The bill requires parents to use federally-approved child restraint systems when transporting children under four in family-owned motor vehicles. Until 1981, the law permitted parents the dangerous option of having the child held by an older passenger. When parents are stopped for failure to use restraints, police provide

a loaner car seat and issue a ticket. At the court appearance the loaner must be returned and, if parents show proof of a car seat purchase, the $25 fine is waived. Evaluations indicate that car seat use has risen from 8 percent before the law to 44 percent after enactments (Williams and Wells 1981).

- The California bill uses an educational approach. The law promotes car seat use through two community-wide educational efforts lasting two years. Police officers can issue warnings, but not tickets or fines. The outcome of the bill will be evaluated and may support comparisons between the educational and mandatory approaches.

Profile 12 describes the Massachusetts effort to pass and implement a law. Passing the law involved creating a support network, introducing the legislation, and working for passage. Implementing the law involved training police and informing the public.

* * * * *

This Chapter presented sample prevention interventions in three categories: education, technology, and government action. These interventions are not prescriptive; they illustrate various approaches tried by others. Which interventions are selected and how they are combined into a strategy depends on each individual situation. Remember, there is no one "right" way, but overall program effectiveness can be increased by using multiple strategies from each category.

HOME INJURY PREVENTION PROJECT (HIPP)

Massachusetts Statewide Childhood Injury
Prevention Project

Objective: Reduce the number of household hazards and severity of childhood injuries through State sanitary code providing conseling to improve parents' prevention behavior, and distributing and installing safety devices.

Population At Risk: Children through five years

Audience: Mothers, homeowners, or landlords.

Background: HIPP was developed to promote injury prevention counseling during sanitary code inspections. The intervention combined active and passive countermeasures. Its major focus was discussing hazards and preventive behaviors with parents. Sanitary code violations dangerous to children also were identified and corrected. A housing inspector was jointly employed by two boards of health in adjoining towns. This inspector provided a role model for the other inspectors. Approximately 350 housing units were inspected between October 1980 and October 1982.

Design: A standard approach was developed to conduct inspections, provide counseling, and enforce the sanitary code. The first step was a home visit consisting of three concurrent activities:

- Inspectors examine the dwelling to assess compliance with the sanitary code. Using a 29-item coding form they inspect and record the conditions related to childhood injury in the structure, common areas, each individual apartment (kitchen, bathroom, living room, infant/toddler sleeping areas), and the basement. Items noted on the form include "stairs in good repair," "hallways and stairs properly illuminated," "adequate locks and screens on windows," and "water temperature."

- Inspectors examine each listed area for household hazards. A similar coding form describes 45 hazards including:

  - "Toddler gates at top (and bottom) of stairs"
  - "Household products/medicines stored in areas inaccessible to children"
  - "Shock stops on unused electrical outlets"
  - "Bumper guards on crib"

Inspectors provide prevention counseling regarding household hazards. A household hazard education manual, given inspectors, describes each item on the form, why it is a hazard, and how it can be corrected. Inspectors also distribute and install safety supplies, ipecac, a poison center telephone sticker, and a household safety checklist. Young children are tested for lead poisoning.

- If a housing code violation exists, inspectors file a report with the local board of health, notify the landlord, and request the violation be corrected within 30 days. Inspectors revisit the dwelling 30 days later to determine if the violation has been corrected. If not, they begin legal proceedings against the landlord.

Materials: HIPP inspectors use the following materials:

- Housing Inspection Coding Form and Coding Guide
- Household Hazard Education Form and Coding Guide
- Household Hazard Education Manual
- Safety Supplies:
  - Shock Stops
  - Cabinet Locks
  - Kindergards
  - Poison Control Sticker
  - Ipecac
- Handouts:
  - Poisons in the home
  - Poisonous plants
  - Household safety checklist

Additionally, a brochure was designed to publicize the program.

Implementation: Program implementation required a full-time housing inspector trained in health education. In one community, the inspector conducted inspections in public housing under a Systematic Code Enforcement program. In the other, the inspector went door-to-door and received referrals through the board of health complaint process and social service agencies. Much time was spent locating appropriate households with children under six. To allay parental fears during the door-to-door process, the inspector made appointments for a later date rather than conducting inspections then. Each inspection required about one hour. All materials including safety supplies can be reproduced or purchased at low cost.

Comments: HIPP appeared more suited to urban areas than rural or suburban areas. In the latter two areas local boards of health resisted inspecting owner-occupied housing. Homeowners were asked to volunteer but few did. Inspecting urban rental units proved more feasible. However, some tenants refused inspection because they were afraid of landlord repercussions. The participating boards of health felt the project was useful; one community instituted its first legal proceedings in 20 years.

An evaluation was performed to determine if hazards were reduced following the visit and to obtain parental feedback. A sample of 82 households was selected. An independent observer found non-code hazards were reduced from 13.1 to 6.6 unsafe items per household. Code hazards were reduced from 11.1 to zero per household in those households for which the sanitary code was enforced.

Massachusetts staff offered the following recommendations for programs replicating HIPP:

- To overcome resistance in rural and suburban areas, publicize the activity as a "household safety check" rather than code enforcement, and advertise the availability of free safety devices.
- Focus on communities with an existing interest in injury prevention.
- Employ local people with established community relationships; these people can avoid the time-consuming door-to-door identification process and parental suspicions.
- Consider developing an educational slide show about household hazards for promoting HIPP to social service agencies and other referral sources.
- Modify the HIPP approach to hazard identification and counseling for use by any home-based service program like visiting nurses.

SAN DIEGO DEPARTMENT OF SOCIAL SERVICES, LICENSED DAYCARE

California Childhood Accident Prevention Project

Objective: Create a safe environment in licensed daycare homes by counseling caretakers during the licensing process.

Population At Risk: Children through four years

Audience: Daycare providers, mothers

Background: The daycare home licensing process provided an authoritative distribution channel for accident prevention information. The cooperation of the Department of Social Services, San Diego County, was enlisted on a project using regulatory requirements to influence safety practices. Licensing evaluators inspect daycare homes before awarding licenses and on an annual basis thereafter.* Inspections include assessing safety conditions; accident prevention counseling easily can be integrated. Prevention messages can be targeted by the age and developmental level of the children being cared for in the home. Daycare homes, in turn, can channel prevention information to children's natural mothers.

Design: Licensing evaluators were instructed in prevention counseling; project posters featuring prevention messages were displayed in the licensing office conference room. The evaluators followed these steps when performing an inspection:

- Evaluators reinforce project messages through the regular inspection process (e.g., keep poisonous products out-of-reach).
- After the inspection, evaluators spend five to 10 minutes talking about prevention techniques.
- Evaluators give daycare providers a pre-packaged kit containing prevention materials.

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* Due to budget cuts, the frequency of inspections was expected to be reduced.

- Evaluators also give daycare providers a postcard to be sent home with each child. The postcard offers a free childhood accident prevention packet containing the same materials given to the daycare provider.

- On annual visits thereafter evaluators assess the daycare providers' adoption of these accident prevention techniques.

Materials: The pre-packaged kit contained:

- "Prevention is no Accident," a brochure about prevention techniques and first aid

- "What's Hot in Our House?" a burn hazard coloring book

- Poison Control Center telephone sticker

- Ipecac

- Postcard for parents requesting kit

- Project posters featuring prevention messages

Implementation: Two licensing evaluators participated in the program. Although delivering accident prevention messages added to their workload, the evaluators felt it was not a major problem. Evaluators kept records concerning the number of kits and cards distributed. Each kit cost approximately $.75 plus the ipecac.

Comments: Licensing evaluators were pleased with the intervention. They felt that accident prevention was their responsibility and counseling was easily incorporated. One evaluator believed her authority as a State representative increased the seriousness with which the messages were received. Counseling will continue. The Department is also seeking licensing regulation changes to require that ipecac be kept on hand and that poisons be kept in locked cabinets. Parents responded well to the materials offer; 40 percent returned cards to request the materials packet.

PASSAGE AND IMPLEMENTATION OF A CHILD PASSENGER SAFETY LAW

Massachusetts Statewide Childhood Injury Prevention Project
Child Auto Passenger Safety Resource Center
Massachusetts Department of Public Health

Objective: Reduce motor vehicle injuries by increasing proper car seat usage through passage and implementation of a mandatory child restraint law.

Population At Risk: Children through four years

Audience: Legislature, police, community-at-large, especially mothers of children under five

Background: Massachusetts' mandatory child restraint law was passed on December 31, 1981. The law reads "All children under the age of five must be fastened in a properly adjusted car seat or seat belt." The fine is $25 and can be waived if proof of car seat purchase is given. There is no insurance surcharge. Exemptions include: vehicles without seat belts, vehicles with all seat belts and car seats in use, vehicles for hire (taxis, limousines, etc.), and children physically unable to use a seat belt or a car seat. Passage of the law concluded a nine year effort; subsequent emphasis turned to educating the police and public.

Design and Implementation: Design and implementation were intertwined and, therefore, are discussed together. The effort is described in two major parts. The first part, passing the law, concentrates on legislative approach. The second part, implementing the law, focuses on the educational effort. Suggestions from the National Conference on Injury Control proceedings have also been included in the following description (Centers for Disease Control 1981b).

Passing a mandatory child-restraint law involves three activities:

- Creating a support network
- Introducing legislation
- Lobbying for passage

Creating a support network for the proposed legislation is a crucial first step. A broad-based, 29-member Advisory Board was established. Their contacts, speaking skills, and technical expertise were used throughout the effort. Look for representatives from the following kinds of organizations:

- Practicing physicians and hospitals:
  - Pediatricians
  - Trauma unit staff
  - Pathologists, coroner
- Medical society and local chapter of the American Academy of Pediatrics, particularly legislative affairs specialists
- Hospital associations, particularly legislative affairs specialists
- State and local police chiefs
- Registry of motor vehicles officials
- Auto-related businesses, (e.g., State Auto Dealers, AAA)
- Concerned government agencies (e.g., Highway Safety Bureau, Department of Transportation, Office of Consumer Affairs)
- Safety Council
- Consumer/grassroots organizations (e.g., PTA, Highway User's Association)
- Media

The board should contain powerful constituents who can influence legislators and other decision-makers. For example, police officials can demonstrate their support and willingness to enforce the new law; media representatives can ensure coverage of the legislative process and educate the public.

Introducing legislation involves both drafting the bill and enlisting sponsors. Suggestions regarding drafting of the bill include:

- Using the proper format, title, logo, and legislative coding; these items can influence committee assignment.
- Including conditions that can be negotiated away without weakening the bill.

Select sponsors carefully. The primary sponsor should be committed to the issue and, if possible, a power in the legislature. Adding liberal and conservative co-sponsors can increase support for the bill and ensure that child auto restraints are not seen only as a liberal issue.

Working for passage involves organizing State agency and grass roots support, publicizing the bill, and holding a hearing. Support can be organized in three ways:

- Involve legislative aides in other concerned State agencies (e.g., Department of Public Safety, Department of Transportation).
- Contact child passenger safety advocates in home districts; promote letter and phone call campaigns aimed at legislators.
- Maintain a contact list of legislators, assign staff responsible for contacting them, and keep up to date on how they plan to vote.

Information can be provided through newsletters and the media. Suggested topics and activities include:

- Stress that motor vehicle accidents are the leading cause of death and injury.
- Publicize the cost/benefit ratio of passing the bill by comparing the cost of implementing the law with the amount of money the State could save by reducing injuries.
- Conduct public opinion polls and publicize results that indicate voters support the bill.
- Emphasize that other States already have this law; this State does not want to be viewed as backward.
- Use an emotional appeal—"We have to protect our children because they cannot protect themselves."

A hearing educates legislators, provides useful facts and arguments for bill sponsors, and demonstrates support for the bill. Advice on holding hearings includes:

- Have interesting and persuasive advisory board members, especially police chiefs, business representatives, and physicians, testify for the bill or be present at the hearing.

- Present the most effective witnesses first and last.
- Publicize topics described earlier in a simple, hard-hitting, one-page handout.
- Open the hearing with a media event or personal anecdote to dramatize the issue.
- Work closely with the committee chairperson's staff to create a favorable setting

Implementing a law involved training the police and informing the public. A slide/tape show was developed for local and State police. Police were trained through seminars sponsored by the Governor's Highway Safety Bureau. Training materials also were provided to the Criminal Justice Training Institute for their monthly sessions. Police were supplied with copies of the law, "Cite your Rights" cards, and Buckle-up-Bear stickers to distribute to parents.

Public education activities were many. Maternity education and car seat loan programs were developed for hospitals. A resource library containing education materials was established. Its formation was announced to pediatricians through a publicity mailing; 20,000 brochure requests resulted. Surveys were conducted to determine car seat availability in retail stores and car rental agencies. A volunteer speaker's bureau and health fair displays increased visibility in the community. Passage of the law also was promoted through television and radio interviews and PSAs.

Materials: Many different materials were used, including:

- "Child Auto Safety" newsletter
- "Buckle-up Bear" stickers and coloring book
- "A Family Shopping Guide To Infant/Child Automobile Restraints"
- "Cite Your Rights" cards
- "Kids Count On You" brochure
- Resource Center brochure cataloging audiovisual and written material
- Slide/tape presentation for police

CHAPTER SEVEN

VII. DESIGNING PREVENTION MATERIALS

Developing materials to spread and reinforce prevention messages provides an outlet for creativity, produces tangible results, and, by so doing, generates staff investment and pride in the prevention program. The program can design new materials, select existing materials (given limited resources), or combine new and existing materials. Prevention materials may take the form of fliers, brochures, and pamphlets; newsletters; posters; stickers; coloring books, balloons, and games; slide shows and films; training manuals, scripts, interview guides, questionnaires, checklists, and protocols; photographs and drawings; and samples of safety supplies (e.g., syrup of ipecac, electrical outlet covers, kitchen cabinet locks). Table 16 lists some major media options and provides a few examples of how each might be used by prevention programs. The list is by no means exhaustive but does indicate the immense variety of choices that might be considered.

The most important characteristic of prevention materials is that they be well suited to the purposes of the prevention program and its specific interventions. Most programs will find two types of materials necessary: those that promote the prevention program overall and those that support prevention interventions. This Chapter discusses both types of materials, the advantages of using existing materials compared to developing new material, and the many tips learned by the demonstration projects.

1. MATERIALS THAT PROMOTE THE PROJECT OVERALL

Every program should develop basic public relations materials. Such materials will be useful in letting caretakers, community organizations, health care providers, potential supporters and collaborators, and the press know that the program exists. Materials also can keep the public informed about program accomplishments. At a minimum, most programs will need these public relations materials:

- **A self-mailing introductory brochure or flier**—This will be the first document most people see about the program. It should have the same graphic design (e.g., logo, colors, slogans) as other program materials (to begin creating community awareness and recognition). The document should begin by explaining the problem of accidental childhood injuries and then provide information about program goals, sponsorship, and activities. It should end by telling readers where to turn for additional information and how to become involved. Because this document will be used in large quantities, take care to select a design that will be relatively inexpensive to print. Figure 11 shows one side of the brochure used by the California project.

- **A source of continuing information about the program**—Most programs will publish (or simply photocopy) a periodic newsletter, outreach letter, bulletin, or other document to keep interested parties informed. Aside from enumerating (and therefore generating support for) program accomplishments, this instrument also can disseminate

TABLE 16

MAJOR MEDIA OPTIONS

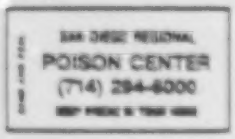
MEDIA	EXAMPLES	COMMENTS
Coloring Books	• Burn prevention coloring books (California Project)	• Involves child and caretaker in common activity during which safety messages can be taught
Films, slides		• Stress in public library where citizen groups can check them out • Requires investment in (and ongoing maintenance of) projectors
Posters, counter displays	• Simple message posters on burn safety, poison control, and auto safety posted in pediatrician offices and clinics (California and Massachusetts Projects) • Counter displays to promote sale of ipecac posted in pharmacies (All projects)	• Can be used in many settings to heighten awareness • Do not mass posters for commercial establishments too large (they take up prime advertising space)
Presentations and displays	• Backdrop and two side displays supported by light boxes to promote prevention project (used at health fairs and other gatherings by California Project) • Flip chart presentation used as framework for lectures to community groups (California Project) • Look-alike displays to dramatize how child might confuse safe and unsafe products (e.g., breathmints vs. vitamins soft drinks vs. radiator fluid) (Virginia Project)	• Stress portability and durability • Use bright colors, balloons, and other attention getters to draw people to presentation • Be sure display is staffed at all times with person who can answer questions
Safety supplies	• Car seat loans (Massachusetts Project) • Syrup of ipecac (All Projects) • Covers for electrical outlets distributed to homes (Massachusetts Project) • Safety supplies used as props for discussions and counseling (Massachusetts Project)	• Show parents proper use of safety supplies • Install supplies and equipment (e.g., electrical outlet covers) or actually observe parents doing same to ensure use • Use giveaways as incentive for caretakers to complete questionnaires, attend lectures, etc.
Scripts, presentations	• Anticipatory guidance script followed by periodically marked reminders to counsel parents (Virginia Project) • Discussion leader's guide on childhood injury prevention (Massachusetts Project)	• Tailor to audience • Provide training in proper use
Stickers 	• Window stickers to identify rooms where small children sleep (in case of fire) (Massachusetts Project and Others) • Telephone stickers with emergency number for poison control center (All projects)	• Proved popular in demonstration projects and quite inexpensive • Keep message simple
Surveys, questionnaires, protocols	• A pediatric counseling manual (Massachusetts Project) • A survey to inspect homes for risk situations and counsel homeowners in prevention (Massachusetts Project) • Treatment response protocols for use in hotlines and poison control centers (Virginia Project)	• Provide adequate training in use of survey or other instruments

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FIGURE 11

SAMPLE PUBLIC RELATIONS BROCHURE
CALIFORNIA CHILDHOOD ACCIDENT PREVENTION PROJECT

WHO WE ARE

The Childhood Accident Prevention Project of the University of California, San Diego, is a special program whose goal is

- to reduce the frequency and severity of injuries in children

We are working in conjunction with the San Diego Regional Poison Center and are funded by California Children Services through a grant from the Department of Health and Human Services, Bureau of Community Health Services.

OUR PROGRAM

We will conduct a model targeted injury prevention program in San Diego and Imperial Counties for three serious conditions in young children:

- Poisonings
- Burns
- Head injuries

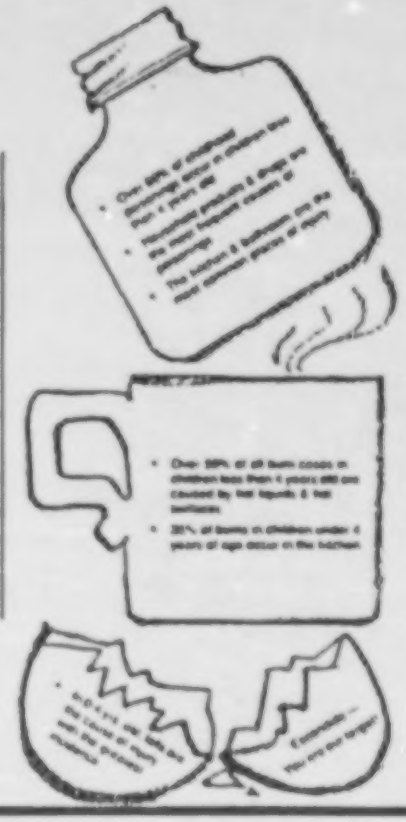
OUR DATA BASE

Data collected on these injuries from hospitals and household surveys in San Diego and Imperial Counties show that:

- the population at highest risk is 0-4 years of age
- the most common place of injury is in the home

The injuries most frequently encountered are:

- Poisonings — with common household products and drugs
- Burns due to scalds and contact with hot surfaces
- Head injuries due to falls



THE PREVENTION PROGRAM

Specifically targeted prevention programs directed at mothers of children 0-4 years old will be first conducted and tested in Escondido and then replicated in the rest of our region.

Escondido was chosen because it represents a broad range of ethnic and socio-economic groups including rural populations. It also contains a well-defined medical community.

COMMUNITY COOPERATION

An advisory committee of representatives from the medical profession, health community and various local agencies and organizations is assisting the project staff in all phases of program implementation throughout Escondido.

WHO WILL BENEFIT

This project will directly benefit the children and parents of San Diego and Imperial Counties. All of the materials and programs we develop and test will be available for future use in San Diego and Imperial Counties, and by other communities nationwide.

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up-to-date information about the problem, report on related legislative developments, profile similar programs being conducted elsewhere, extend thanks to staff and collaborators who have done especially good work (a real morale booster), and catalog upcoming events of interest (e.g., health fairs, public hearings, demonstrations). More important than flash or form is regularity; keep interest in the program high and give the impression that the program is a serious enterprise by sending it out according to a regular schedule.

- **A presentation**—To spread its message most widely, the program will give speeches to community and provider groups, to possible financial supporters, at health fairs, and the like. Develop a portable demonstration (e.g., stand-up placards, a poster or photo display, a safety supply display board, a slide show) and one or more speeches, discussion guides, sets of lecture notes, and other presentation aids. Be sure materials are very durable and easily transported and assembled (anticipating that they will be used often); make the demonstration material exciting and eye catching by using bright colors and simple slogans; use the program logo liberally (to develop community recognition); let interested parties know where to turn for additional information and to provide financial assistance and other help.

2. MATERIALS THAT SUPPORT PREVENTION INTERVENTIONS

Beyond general public relations materials (which transcend the particulars of a given intervention) are materials designed specifically to support prevention strategies: this presupposes that the strategies (and associated interventions) have been selected and that their purposes are well articulated. To aid this discussion, prevention materials are considered to be of three principal types: those that educate children and their caretakers, those that train or support prevention workers, and those that demonstrate actual safety supplies. Use the following brief discussion to focus decisions about what is needed to implement program objectives:

- **Materials to educate children, caretakers, and the general public**—Educational materials include simple handouts on poisonous plants; slide shows showing parents how to respond when injury occurs; and draft legislation designed to eliminate particular hazards from the environment. To be effective, such materials should clearly state the nature of the problem (answer the audience's question "Why is this a problem for **me**?) and explain clear and simple ways in which the audience can address the problem. The materials may be asking the audience to respond on one of three levels:

  - **Be aware**—These materials explain the potential for accidental injury (e.g., describe injury statistics, describe the circumstances of injuries) and ask the audience to **anticipate** problems before they occur. They are simple, do not tax the audience, and serve as a stepping stone for more thorough educational

efforts. Examples of such materials are photographs of potentially hazardous cribs or playground equipment; statistical reports on accidental burns by scalding water; and public radio announcements concerning the importance of smoke detectors.

- **Prevent**—These materials explain exactly how to prevent injuries (or reduce the chances that injury will occur) and ask the audience to **take steps** to implement prevention measures. Examples of such materials are brochures that discuss proper storage of household products; stickers that remind parents to buckle children's seat belts; and games and toys (e.g., coloring books) that teach children not to touch hot objects.

- **React**—These materials explain what to do when injury occurs and ask the audience to **practice or commit to memory proper procedures.** Examples of such materials are telephone stickers with the poison control center emergency number, pharmacy sales campaigns urging parents to buy and keep on hand ipecac, films showing how to get out of a fire safely, and CPR courses.

The choices in developing prevention educational materials are almost endless. Materials may take many forms (written, visual, experiential media); may be addressed to many audiences (children, parents, legislators, other caretakers); and may serve many purposes (generate awareness, prevent accidents, teach responses). Consequently, the first important step in developing educational materials is to focus sharply on the audience and purpose and only then, taking these into consideration, to decide on the form (media).

- **Materials to train or support workers**—Materials to train or support workers include anticipatory guidance scripts for health care providers; housing inspection surveys for public officials; treatment protocols for emergency department workers; and reference materials for hotline telephone staff. To be effective, such materials should explain the problems workers are asked to address, why these workers, in particular, can help (e.g., draw upon existing professional expertise; have access to target group at risk; commitment to child health and public safety), and what workers are expected to do.

  Training and support materials should anticipate and address operational problems that workers are likely to encounter (usually pretesting is needed), should provide references to additional sources of information, and should be kept up-to-date.

- **Safety supply materials**—Prevention materials that can be distributed to caretakers include syrup of ipecac (an especially popular supply distributed by all three demonstration projects); window stickers to mark children's rooms for fire fighters; smoke detectors; car seats (usually on loan); and electrical outlet covers. To be effective, such materials must be distributed widely and used properly; materials will be wasted if distributed but not used; they may be dangerous if used

improperly. Therefore, supplies should be distributed only as part of a larger educational campaign in which recipients are encouraged to actually use the product, are taught to use it correctly, and, possibly, are contacted at a later date to reinforce their understanding of proper use.

3. DECIDING TO MAKE OR BUY MATERIALS

Every program faces a fundamental "make or buy" decision as it launches into material development. Figure 12 illustrates that the choices fall along a continuum; moving from left to right along the continuum generally (not always) results in increased expense and production time, increased suitability of materials to program purposes, and increased staff commitment to the materials (and, possibly, increased commitment to successful intervention implementation). The four stages of the continuum are:

- **Use existing materials "as is"**—This decision will be appropriate when existing materials have been used elsewhere to support interventions very similar to those planned by the program; materials should have been tested with audiences similar in education level, language proficiency, age, setting, professional background, and so on.

- **Tailor existing materials**—This decision will be appropriate when existing materials are adequate (but not ideal) to meet program purposes. For example, materials might be translated from English to Spanish; might be modified to reflect local poison control emergency telephone numbers; might be edited to address a less literate audience; might be enhanced by drawings, slide shows, or more colorful design; or might be combined with other materials to produce a different effect.

- **Review existing materials to generate ideas**—This decision is appropriate regardless of how the program eventually elects to proceed. Tremendous professional energy and talent have gone into developing prevention materials of all description. Take a few weeks to gather and review existing materials before electing a final approach. Ask for samples, and ask whether reproducible copy (i.e., camera ready) or bulk quantity materials are available (at what price); identify copyright prohibitions, if any. Ask suppliers to explain briefly how materials have been used elsewhere, who the target audience was, and what successes or problems have been experienced. Ideas that might result from reviewing existing materials are:

  - Outlines for public relations brochures
  - Methods of packaging prevention materials
  - Logos and slogans
  - Design integration concepts (i.e., making all materials look like they belong together)

FIGURE 12

THE "MAKE-BUY" DECISION

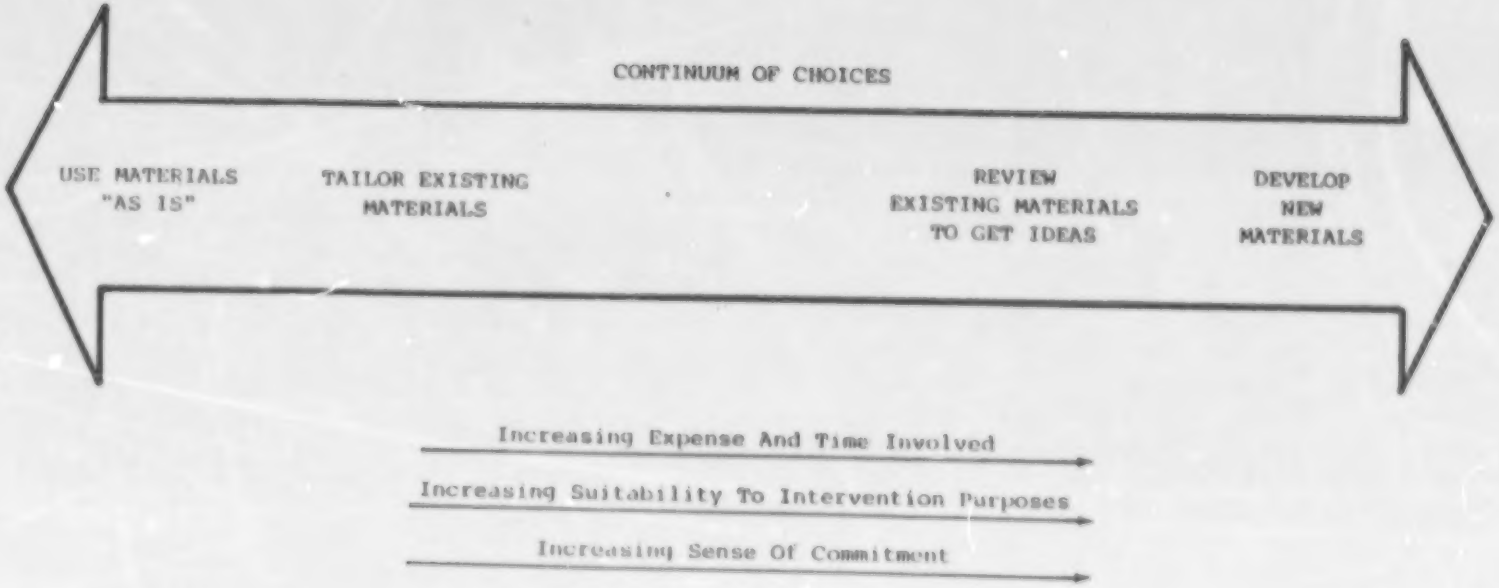
CONTINUUM OF CHOICES
USE MATERIALS "AS IS"
TAILOR EXISTING MATERIALS
REVIEW EXISTING MATERIALS TO GET IDEAS
DEVELOP NEW MATERIALS
Increasing Expense And Time Involved
Increasing Suitability To Intervention Purposes
Increasing Sense Of Commitment

TABLE 17

POTENTIAL SOURCES OF CHILDHOOOD INJURY
PREVENTION MATERIALS AND INFORMATION

1. American Academy of Pediatrics
   Accident and Poison Prevention Committee
   1801 Hinman Avenue
   Evanston, Illinois 60624
   (312) 869-4255
   (Some demonstration project anticipatory guidance materials
   will be available through AAP in Spring 1983).

2. National Fire Protection Association
   Batterymarch Park
   Quincy Massachusetts 02269
   (617) 328-9290
   (Project Burn Prevention materials are available through NFPA)

3. National Poison Center Network
   125 DeSoto Street
   Pittsburgh, Pennsylvania 15213
   (412) 647-5600

4. U.S. Consumer Product Safety Commission
   1111 18th Street, N.W.
   Washington, D.C. 20207
   (800) 638-2772 (outside of Maryland)
   (800) 492-8363 (Maryland only)

5. American Trauma Society
   875 North Michigan Avenue
   Chicago, Illinois 60611
   (312) 649-1810

6. Physicians For Automotive Safety
   50 Union Avenue
   Irvington, New Jersey 07111
   (201) 926-1730

7. American Lung Association
   1740 Broadway
   New York City, New York
   (212) 245-8000

8. National Highway Traffic Safety Administration (NHSTA)
   400 7th Street, S.W.
   Washington, D.C. 20590
   (202) 426-2180

9. American Automobile Association
   8111 Gatehouse Road
   Falls Church, Virginia 22047
   (703) 222-6000

10. Insurance Institute For Highway Safety
    600 New Hampshire Avenue, N.W.
    Washington, D.C. 20037
    (202) 333-0770

11. American Seat Belt Council
    1730 Pennsylvania Avenue, N.W.
    Washington, D.C. 20006
    (202) 393-1300

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- **Develop new materials**—This decision is appropriate only after the program has reviewed enough materials to be convinced that no suitable materials exist. The ability to develop new materials also depends on the availability of funds and professional expertise.

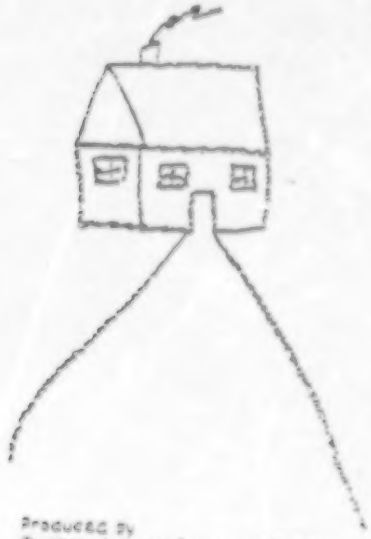
Table 17 lists 10 selected national organizations in addition to the three demonstration projects from which sample materials can be obtained.

There is no one right decision for all interventions or even for all materials for a single intervention. Most programs will employ a variety of techniques, using some existing materials and developing others. Each decision must balance cost, time, and convenience constraints, yet assure that materials are adequate.

4. DEVELOPING MATERIALS: LEARNING FROM THE EXPERIENCES OF OTHERS

Programs can learn from the experiences of others. Lessons learned (some, the hard way) by the demonstration projects are listed below:

- **Develop a readily identifiable logo and slogan**—Each program should design a simple, eyecatching logo and slogan. It should be readily identifiable to create community awareness about the program; unify various program materials, and assure that the program gets credit for its efforts. However disparate, each material used by the program should bear the logo and slogan. For example, the California project used a child's crayon drawing of a house as its logo (see below); this emphasized that the target environment for prevention efforts was the home and generated empathy on the part of homemakers.



Produced by
Childhood Assault Prevention Project

- **Develop multi-lingual materials:** People may respond better to materials prepared in their native language; even if the target population is conversant in English, people may learn more from materials translated into their birth tongue; moreover, in taking time to make the translation, the program demonstrates real personal concern for large segments of the target audience (see example below).

- **Develop materials that can be mixed and matched to respond to different needs**—Develop materials in modular form so that different combinations of materials can be assembled for use with specific audiences. Inexpensive options for packaging materials to individuals include cardboard folders and plastic bags with twist ties; materials to be distributed to groups for their own use (e.g., prevention kits) or can be packaged in durable cardboard boxes with an index of contents on the outside to assure that all materials are returned.

- **When possible, distribute materials personally**—At health fairs, presentations, speeches, and other group events, do not simply leave materials in a "take one" bin; have a prevention worker standing by to hand out materials, explain the program, answer questions, and underscore the prevention messages.

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- **Pretest materials or solicit independent review**—Ask representatives from participating organizations to review public relations and information materials; the materials may be improved and the organizations will begin to feel invested in the program. Pretest educational and training materials to be sure that they have the desired impact on the audience.

- **Do not "date" the material**—Develop materials that can be used for a long time in the future, even if administrative changes occur in the program. For example, when referring to the program director, use his/her title instead of name; when referring to events that are in progress or in the future, couch the terms so the material does not become out-of-date once the event is past.

- **Be sensitive to constraints at the distribution sites**—Prevention materials will be distributed through commercial enterprises, health or social workers, and others. Help distributors by making sure materials can be easily stored, are not overly large (e.g., do not take up too much important advertising space), and so on.

- **Encourage commercial companies and other social programs to underwrite printing costs in exchange for advertising**—Many civic minded groups in the private and public sectors will be very pleased to pay for printing (e.g., of stickers, brochures, posters) if they are allowed to print their name on the document. (See example below; sticker paid for by the Massachusetts Safety Council.)

- **Develop durable materials**—If materials are going to get wide circulation (as is the case with films, manuals, presentations) make sure they are durable so they will continue to look presentable and be serviceable after many uses. Develop posters on heavy paper or have them shrink-wrapped to discourage tearing.

- **Design materials that conform to (rather than defy) current reproduction standards**—Use standard page sizes (so regular envelopes can be used); use light weight paper (so mailing costs can be kept low); avoid inks that are not easily photocopied (light blue is especially bad) (so that materials can be photocopied and shared within agencies, among friends).

- **Develop and keep on hand camera-ready copy for use by interested parties**—Encourage community groups and providers to copy materials for their own use (and save the expense) by making camera-ready copy available.

- **Have materials produced professionally, if possible**—Among other messages, the program must strive to impress upon the community that it is a professionally run organization devoted to a serious problem. Professionally prepared materials are likely to have a more positive effect on the audience than materials without a professional flair.

- **Use an integrated design concept to relate all materials**—All materials should be based on similar design concepts (e.g., color schemes, graphic approaches, lettering style) so that they appear to be pieces of a whole. People who have seen some materials will be drawn to other materials in the set by the familiar design.

- **Use short, clear messages**—Educational materials should contain short, clear messages; too many messages compressed in a single material will confuse the audience and dilute the most important ones.

- **Send positive messages**—Messages about childhood injuries can evoke strong negative feelings in caretakers and children. Stress that accidents are not fated, unpredictable occurrences and that much can be done to avoid them or minimize their effects. Do not show the gruesome aftereffects of accidents except with care (never to small children). Play on hope, not fear.

- **Tailor material to the audience's learning ability**—The demonstration projects found it difficult to reach all audiences with a single type of message. Consider the age, educational level, and professional background of the audience in developing written and visual materials. For example, children have short attention spans and need variety.

PART C

C. IMPLEMENTING AND EVALUATING THE PROGRAM

This section contains the three following Chapters:

- **Chapter VIII: Organizing And Administering The Program**—This Chapter discusses structuring the program in-house versus subcontracting, determining staffing needs, and administering the program.

- **Chapter IX: Selecting And Working With Local Communities**—This Chapter provides information about choosing appropriate local communities in which to implement your program and obtaining the support of local leaders.

- **Chapter X: Evaluating The Program**—This Chapter reviews designing and conducting the evaluation, analyzing the results, and anticipating evaluation difficulties.

CHAPTER EIGHT

VIII. ORGANIZING AND ADMINISTERING THE PROGRAM

Organizing and administering a childhood injury prevention program involves considering these topics:

- **Program Structure**—To what extent will the State Title V Agency design and implement the program itself or contract it out to other organizations?
- **Program Staffing**—What core staff will be needed and how might staff extenders (i.e., consultants, gatekeepers, and volunteers) be used?
- **Program Implementation**—How will the program be scheduled, budgeted, and monitored?

1. STRUCTURING THE PROGRAM

Several factors influence the decision about program organization:

- Prevention activities already being conducted by other parties (e.g., Department of Transportation Vehicle Safety Program)
- The nature of critical injury problems uncovered in the epidemiological study
- The geographic location of critical problems
- The scope of the overall strategy and specific interventions under consideration
- The staff and financial resources available

Three options exist for structuring the program: (1) developing the program within the MCH unit, (2) contracting the program design and implementation to an outside party, such as a poison control center, or (3) having a core staff in the MCH unit and using outside organizations to perform specific tasks. The advantages and disadvantages of each option are discussed below.

The feasibility of having the whole program in-house depends primarily on the type of staff and other resources (e.g., space, computers) available. Keeping the whole program in-house probably is most effective when testing or implementing only one or two interventions.

- Advantages of in-house organization include: firm control over the program, easier management and coordination, and increased chance of institutionalizing childhood injury prevention as an ongoing State concern.

- Disadvantages include: limited flexibility in administrative areas like travel and hiring; restricted geographic reach if the implementation site(s) is not near the MCH office; and underutilization of the experience, credibility, and access of other organizations.

Contracting the whole program out to a university, hospital, poison control center, or other organization relieves the MCH unit of all but monitoring and, perhaps, evaluation responsibilities. By contracting out, programs can be established in multiple communities or regions in a State. These organizations usually have more flexibility in hiring and travel and may have access to in-kind contributions such as student interns and computer time. On the other hand, the MCH unit may lose some control and management may be more difficult because outsiders may not understand constraints on State agency operations. Additionally, MCH unit visibility will be less, making institutionalization harder.

The combined approach takes advantage of existing programs or resources and can help implement programs in different geographic areas. It increases administrative flexibility, preserves management control, and allows visibility for the MCH unit. However, the combined approach may be more difficult to manage on a daily basis.

2. STAFFING THE PROGRAM

Staffing depends, of course, on the overall strategy, the types and numbers of interventions to be developed, and the organizational structure. Even so, most prevention programs share common staff requirements. This section suggests core staff requirements and describes possible working relationships with three types of staff extenders: subcontractors, gatekeepers, and volunteers.

(1) Assembling The Core Staff

The core staff consists of managers for each key program aspect, plus several technical experts. The degree to which each position is necessary depends on the program scope. With that caveat in mind, and on the basis of demonstration project experiences, these core staff positions should be considered:

- **Director or Medical Director**—Having a physician on staff, at least part-time, proved critical. Physicians can provide needed credibility, act as liaison with the medical community, and supply medical direction.

- **Program Director or Manager**—The program director or manager is responsible for overall program management and administration, for securing funds, and for establishing and maintaining linkages with interested parties, the media, and the general public. The director will find that having a basic understanding of epidemiological statistics helps in making optimal use of data. All three demonstration project directors noted that administrative duties took much more time than expected. The director may not have time to participate to a large degree in designing or implementing a program of broad scope.

- **Data Collection and Analysis Manager**—Programs that intend to develop new data bases (e.g., through surveys) should consider assigning one manager to this effort. If the program scope is small, the project director may be able to manage data collection activities.

- **Community Relations Director/Health Educator**—All programs should develop and maintain good communications with target communities. One person should work with the community advisory board, develop program support, conduct speaking engagements, prepare the newsletter, respond to public inquiries, and so forth. Staff continuity in this position is especially critical.

- **Computer Programmer**—A full-time computer programmer may be needed by programs planning an extensive epidemiological study. The demonstration programs tended to underestimate their need for this technician.

Two other technical skills may be obtained through part-time help or consulting arrangements:

- **Public Relations and Marketing Expert**—Public relations and marketing experts can help promote the program to the target group (e.g., parents, legislators, manufacturers) and develop support among the media and general public. All demonstration projects felt a need for extra help in this area.

- **Biostatistician/Epidemiologist**—A biostatistician or epidemiologist will be needed to analyze epidemiological data. Since the amount of time required is small, think about using a consultant.

Additional staff neeeded to implement the program depends on the interventions chosen and the skills of people already on staff.

(2) Using Staff Extenders

Staff can be extended in three ways:

- By subcontracting specific tasks or interventions to outside organizations

- By using gatekeepers to implement interventions

- By recruiting volunteers

Subcontracting with experienced organizations (e.g., survey research firms or health education groups) can be cost-effective. For example, two demonstration projects contracted a telephone research firm to design and implement the household survey. Tasks that are neatly defined, unavailable

in-house, short-term, and not integral to ongoing program functions are appropriate for a subcontract. Also, it is especially appropriate to subcontract with outside organizations that have expertise in a particular injury prevention area or in implementing specific interventions.

Subcontracting offers several advantages. It can build on tested packages, access experienced staff, and reduce start-up time and money. Subcontracting ongoing program components has disadvantages as well. Subcontractor and program priorities and orientations may differ. MCH unit will loose control over some day-to-day operations. Think twice before subcontracting vital tasks to organizations whose primary mission is not very compatible with the task. Be sure that a written contract details specific activities to be performed in terms of quantities, costs, and times.

A second way to extend staff is by using **gatekeepers.** Gatekeepers are people who, because of their position and role in an organization, can deliver interventions to target audiences with relative ease. Examples of gatekeepers include:

- Pharmacists, who participate in a poisoning prevention intervention by distributing ipecac and literature
- Public health nurses, who counsel parents after a well-baby clinic visit
- Lobbyists, who promote passage of a mandatory child car seat restraint law

Gatekeepers usually are free to the program and a potent way to reach many people. Select gatekeepers who have wide access to and credibility with the target audience. Also be sure that tasks assigned to gatekeepers are consistent with their mission and easily incorporated in their routine activities.

To solicit support from gatekeepers, explain how participation can benefit them as well as the childhood accident prevention program. Since most gatekeepers are health care professionals or child caretakers, training can be minimal but should not be forgotten. Gatekeepers may be in a position to institutionalize the injury prevention intervention. Disadvantages of using gatekeepers are minimal, as long as the MCH unit maintains daily management responsibility and actively coordinates and monitors gatekeeper-performed tasks.

A final way to expand staff is by using **volunteers.** For instance, student interns helped one demonstration project with short-term technical tasks, like writing a community outreach manual. Junior Women's Club volunteers helped another project staff booths at health fairs; these women also delivered prevention messages about poisons, burns, car seats, and falls to childbirth classes. Community members also can increase local acceptance of and promote investment in the childhood injury prevention program.

The demonstration projects learned several lessons about the effective use of volunteers:

- Keep volunteer tasks simple; view them as supplementary personnel, not core staff.
- Do not expect volunteers to devote all of their time and effort to the project; their other priorities, like school and family, may take precedence.
- Agree on mutual expectations **before** undertaking a cooperative effort.
- Designate a project staff member to oversee volunteers and maintain continuity.

Volunteers usually require more training than gatekeepers. Follow these guidelines in designing a volunteer training session: (Dean 1981)

- Keep sessions short.
- Include a brief overview of the entire program, emphasizing how volunteer efforts fit into the whole.
- Incorporate active, participative learning, like group exercises.
- Focus on one subject at a time.
- Maintain a comfortable, non-threatening atmosphere.
- Provide written materials for volunteers to distribute; people often feel more comfortable when they have something tangible to hand out.
- Solicit volunteer input about ways to improve activities; emphasize the collaborative nature of program operations.

3. IMPLEMENTING THE PROGRAM

Obviously, the strategy and intervention design dictate how the program will be implemented. The three demonstration projects offer a few general guidelines for estimating time requirements, budgeting, and monitoring.

Underestimating the **time required** to complete certain tasks was a major problem in all three projects. Everything seemed to take longer than anticipated. When preparing a schedule, allow extra time if review and comment or consultation with outsiders will be required. For instance, obtaining hospital approval to collect medical records data proved time consuming.

Break each task into components and systematically imagine obstacles to carrying them out. Leave enough time for planning; rushing into the implementation phase without adequately designing the intervention and generating community support seriously affects ultimate impact. Finally, count on taking two to three years to institutionalize interventions in gatekeeper organizations.

While most **budgeting** is fairly straightforward, two aspects of a childhood injury prevention program budget deserve special attention:

- **Data processing** can be expensive and can easily get out of hand; two projects noted that if they could rebudget they would allocate more money for computer time. Take into account the cost of analysis when designing the data collection form. Scrutinize the form for unnecessary data elements that cost more to process than they are worth. Design the data collection form(s) with an eye towards ease of data entry and analysis.

- When choosing **materials**, anticipate the cost over the years. First, determine how many different products will be developed and then estimate the needed quantity of each. Balance the potential cost savings for bulk quantities with the possibility that material will require revision. Obtain estimates for different qualities of materials (e.g., paper, colored ink, graphic design). If costs exceed budget amounts, make trade-offs between quality and quantity to achieve the best perceived benefit.

Careful **monitoring** of intervention implementation is essential to program success and coordination, particularly when subcontractors, gatekeepers, and volunteers are involved. Monitoring techniques used by the demonstration projects included:

- **Meetings**—Weekly with project staff, monthly with subcontractors

- **Reports**—Quarterly reports from subcontractors or gatekeepers that detail progress, problems, and projected activities

- **Forms**—Forms for recording intervention details such as number of people reached and materials distributed

- **Visits**—Scheduled and unscheduled visits to talk with subcontractors, gatekeepers, and volunteers about how implementation is proceeding

CHAPTER NINE

IX. SELECTING AND WORKING WITH LOCAL COMMUNITIES

Although some interventions can be implemented statewide, others are best focused on smaller geographic areas—e.g., regions, counties, or communities. A narrow scope may be appropriate when financial and staff resources are limited, to test new interventions, and when specific communities have expressed interest in participating. Choosing appropriate communities and earning their support are critical program development tasks. This Chapter sets out criteria for selecting communities and presents tips for working with them effectively.

1. SELECTING COMMUNITIES

Epidemiology plays a key role in community selection. Ideally, the epidemiological study should be conducted before the communities are selected and, in fact, the communities should be selected as a result of the study. When resources are limited, it may be necessary to select the communities on the basis of other criteria and then to conduct the epidemiology study only there. Other criteria that should be considered, in many cases, are:

- **Existence Of A Serious Childhood Injury Problem**—Morbidity, mortality, and anecdotal data may reveal that some communities experience high rates of particular childhood injuries. If these data are unavailable or a decision must be made before the epidemiological study is conducted, substitute measures like comparatively high numbers of children in the population and the presence of environmental hazards (e.g., substandard housing, large number of swimming pools).

- **Community Characteristics**—Interventions do not work equally well in all communities. The Massachusetts project, for example, found its intervention to enforce the housing code worked better in urban communities than in rural and suburban communities. In the urban communities, housing units were closer together, facilitating identification of families with children; tenants (who predominate in urban areas) were more likely than owners to approve the inspection. Similarly, communities were more receptive to anticipatory guidance approaches when served by private physicians and when well-child care was a norm. Conversely, anticipatory guidance may not be especially effective in communities where most children receive acute care in emergency departments. Differences in culture and language also may pose a barrier, especially when the intervention relies on existing materials.

- **A Highly Organized And Supportive Health Care Delivery System**—Many interventions require the sanction and participation of physicians and other health care providers. All three demonstration projects found that support from a physician organization (e.g., the local chapter of the American Academy of Pediatrics), a strong Emergency Medical System lead agency, local and county health departments, and an accessible community hospital helped assure successful implementation.

- **An Identifiable And Supportive Community Power Structure**—Gaining support of community opinion leaders is crucial if interventions are to be implemented through schools, county recreational departments, or other community organizations. For example, in one Virginia demonstration project site, PTA leaders helped obtain school board approval for an elementary school poison prevention program.

- **Community Location In Relation To Program Staff Location**—All three demonstration projects found that distance negatively affected the amount of time staff spent in the community. If the program office is not near the community, consider establishing a satellite office to overcome reluctance to travel and to increase program visibility. California staff noted that the 45 minute trip to one site would have been made more frequently if they had an office in which to work between appointments.

2. OBTAINING LOCAL SUPPORT

Support by community leaders and organizations can open doors to gatekeepers, make resources available, and promote the program generally. In eliciting support, a program must decide whom to approach and how to approach them.

The California project suggests contacting local organizations in two stages. First, contact the Medical Society, the local American Academy of Pediatrics chapter, the hospital council, and the main political body. After obtaining their endorsement, move on to organizations and individuals whose staff might participate directly; this includes physicians, pharmacists, clinics, libraries, and the like.

All three projects offered hints about developing relationships with community organizations:

- Discover the informal community power structure; key leaders may be found in unlikely places. For instance, the Massachusetts project learned that librarians were an important, powerful group in rural communities. To uncover names:

  - Meet with town hall personnel
  - Look through current and back issues of local newspapers.
  - Interview long-time residents, civil servants, and other people with a broad perspective on the community.
  - Listen to local radio and television talk programs.

- When sending a program representative to solicit support, choose someone with relevant credentials and the professional stature needed to engender respect. All projects found physicians most responsive to other physicians.

- Be sensitive to organizations' own needs. Know their goals and how the childhood injury prevention program is compatible with them. Explain how the new program can help them rather than focusing on how they can help the new program. Stress that they will incur no cost. Pharmacists found participation enhanced their image and increased store traffic.

- Communicate frequently with supporters, share feedback and data, and recognize their contributions. All projects noted that providing continuing information about community injury problems effectively stimulated interest and support.

- Design interventions that respond directly to community needs. For instance, a Massachusetts community in which three school bus accidents occurred in a short time was very interested in school bus safety.

- Offer technical assistance to communities that wish to develop their own programs or to incorporate injury prevention activities into their ongoing work.

Consider formalizing important relationships by establishing a community advisory board. The California project found their board extremely useful. Begin with a clear idea of the Board's role and then:

- Select Board members **after** choosing targets and strategies, not before.

- Pick only people who have time to work with the program. Avoid selecting only prestigious members so busy that they cannot attend meetings; however, a few such members may be politically wise.

- Balance two types of members: technical experts and community leaders. The former serve as program consultants; the latter provide support, credibility, power and, perhaps, funding.

- Use the Board's expertise to solve specific problems, to open doors, to generate ideas, to uncover resources; do not allow the board to run the program or set policy.

Community support also can be built by publicizing the program well. Develop high visibility by speaking at community meetings, writing articles for the local media, and publishing a newsletter. Chapter VI discusses setting up speaking engagements and working with the media. Chapter VII introduces materials for overall promotion.

CHAPTER TEN

X. EVALUATING THE PROGRAM

Evaluation is an important component of the overall program design and serves three purposes. First, knowing which interventions were effective influences decisions about which interventions to replicate or replace. Second, good evaluation data can sway funding sources. Third, evaluation data can advance the state of knowledge in the childhood injury prevention field.

A good evaluation begins with a good design, one that is built into the program from its inception. Evaluating programs such as these is difficult at best; without the proper groundwork to establish program and evaluation goals and collect evaluation data, useful evaluation may become impossible. Competent evaluation is not synonomous, however, with a major research effort; small scale evaluations can be designed to provide information about key issues (e.g., car seat use). This Chapter describes important elements of evaluation and discusses potential difficulties in conducting an evaluation.

1. EVALUATION MEASURES

To ensure that reasons for success or failure are clearly understood, programs should examine key activities carefully to assess their contribution to meeting program objectives. Figure 13 presents a framework for organizing the evaluation around three categories of measures:

- **Input measures** describe how resources were used in the program. For example, how much money and staff time was allocated to each component of the program? How many brochures were produced?

- **Process measures** describe program implementation. For example, what linkages were established with community organizations? What joint activities were carried out with these groups? Did gatekeepers deliver the intervention as planned?

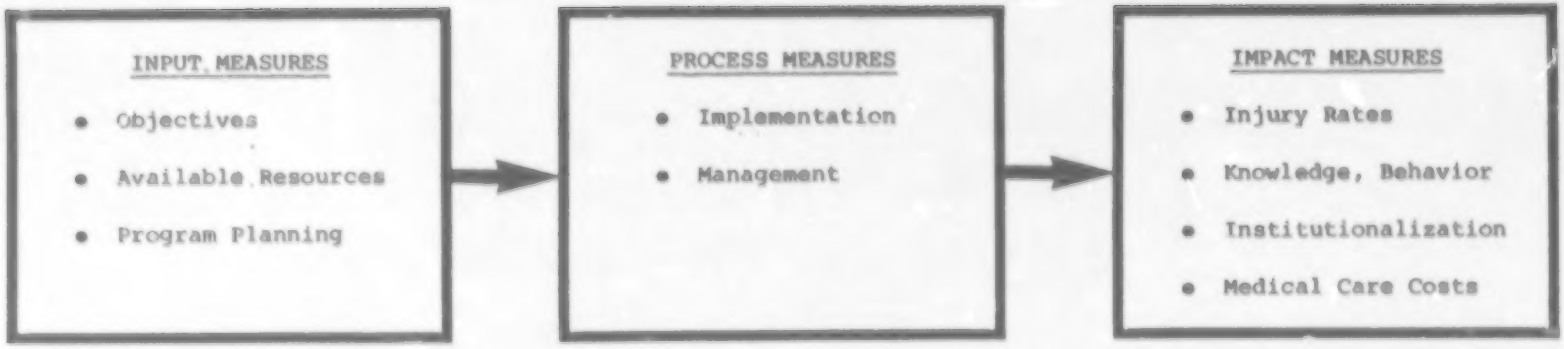
- **Impact measures** describe program outcomes. For example, did target injury rates decrease in the target populations? Did knowledge of specific prevention topics increase?

Select key measures in each category that reflect relative emphasis on corresponding program objectives. Input measure data usually exists in program documentation; process measure data can be collected in routine monitoring of program implementation. On the other hand, impact measures may require collection of new data. Because data collection is expensive, choose impact measures carefully; limit measures to the minimum necessary. Data collection methods described in Chapter III (e.g., hospital records survey, household survey) apply here as well.

Beware of relying solely on injury rate; injury incidence is often low. Unless the program has a large target population or long follow-up period, little or no change may be demonstrated. Use of other types of measures is particularly critical in evaluating educational efforts. An education program can succeed in increasing knowledge, but its effect on behavior and injury rates attentuates over time,

FIGURE 13

EVALUATION FRAMEWORK



(McLoughlin et al. 1982) Figure 14 describes the attentuation of an education campaign effect that was targeted at 100 people. If two-thirds of the population remaining at each step took the next step, only 13 injuries would have been prevented. Evaluation at each step is crucial for understanding why preventive practices do or do not get adopted. For example, process and impact measures for a car seat education campaign might include:

- Percentage of target population receiving materials
- Percentage of target population comprehending message
- Car seat sales and loans (pre- and post-intervention)
- Car seat use (pre- and post-intervention)
- Injury rates for motor vehicle collisions among target population (pre- and post-intervention)

These measures can be linked to explain how different activities affected program objectives. Using the care seat example, Figure 15 illustrates how process and input measures can be helpful in explaining program impact.

2. EVALUATION DESIGN

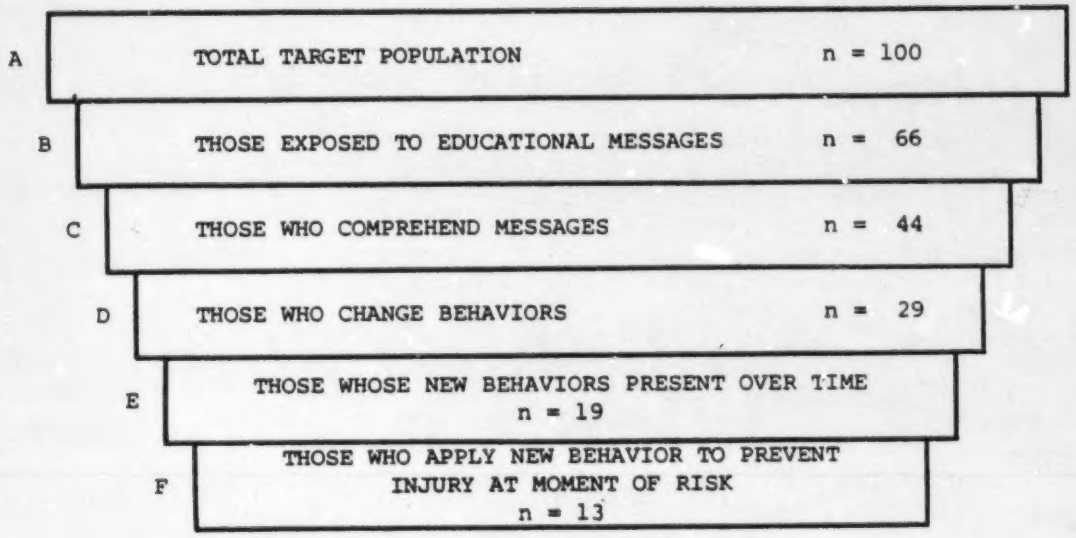
A program can use two types of evaluation designs: a longitudinal study and a direct measure study. **Longitudinal studies** involve "before and after" comparisons among target populations over a specified time period. Baseline data are collected to establish the level of injury rates or other measures of interest before program implementation; outcome data are collected on the same items over a stipulated period during program implementation and after program termination. Baseline data can be gathered as a subset of epidemiological data, if the program plans to collect new epidemiological data. Target populations can range from communities to clinic populations. For example, the Virginia project collected baseline data, implemented a counseling program, and collected outcome data within the patient population of several clinics and physician offices.

Longitudinal studies can be conducted within one target population group or as part of an experimental design involving target and control groups. Control groups help estimate the injury rates and other impact measures that might have occurred in the target group had the program not been implemented. Target and control groups should have similar demographic, socioeconomic, and geographic characteristics. The Virginia project used a control group within each clinic. The Massachusetts project matched three sets of communities—urban, suburban, and rural—to support a "before and after" evaluation design.

The California project evaluation clearly demonstrates the importance of controls. There, statistically significant changes occurred on five out of six of the elements covered by household survey questions, but equally significant changes occurred in the control community also. In only one element did the target community change more than the control community to a statistically significant degree. Without controls, the project mistakenly could attribute the change in the target community to its interventions.

FIGURE 14

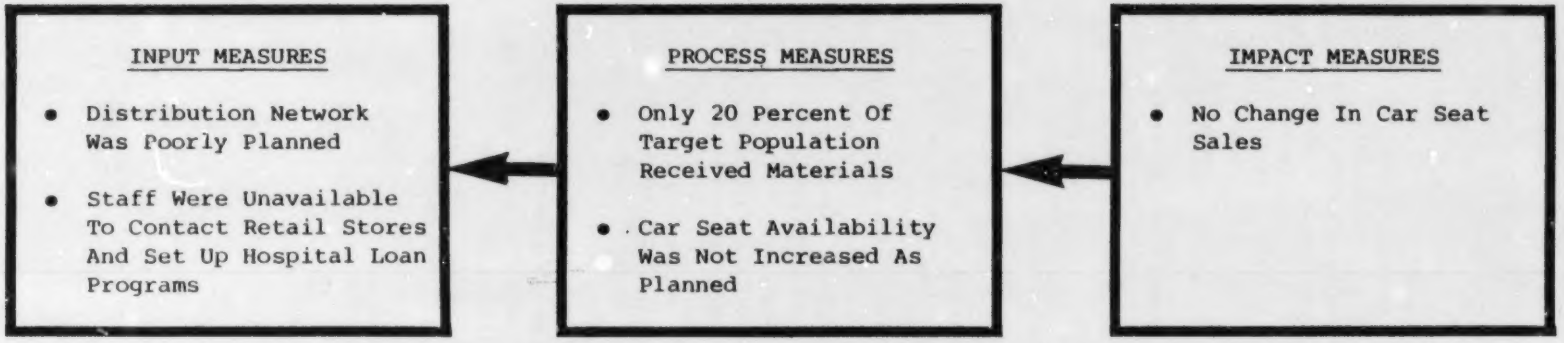
ATTENUATION OF EFFECT OF A
PUBLIC EDUCATION PROGRAM



Source: McLoughlin, E.; Vince, C.J.; Lee, A.M.;and Crawford, J.D. Project Burn Prevention: Outcome and Implications. American Journal Of Public Health 72(3):241-247, 1982.

FIGURE 15

USE OF INPUT AND PROCESS MEASURES
TO EXPLAIN IMPACT FOR OBJECTIVE
OF INCREASING CAR SEAT SALES


INPUT MEASURES
• Distribution Network Was Poorly Planned
• Staff Were Unavailable To Contact Retail Stores And Set Up Hospital Loan Programs
PROCESS MEASURES
• Only 20 Percent Of Target Population Received Materials
• Car Seat Availability Was Not Increased As Planned
IMPACT MEASURES
• No Change In Car Seat Sales

Of course, in-State control groups cannot be used in evaluating statewide programs such as mandatory child auto restraint laws. In these cases, two choices exist:

- First, the program can conduct a longitudinal study without a control. For instance, the Massachusetts Child Auto Passenger Safety Resource Center observed car seat use prior to implementation of a mandatory restraint law; it will conduct a second survey to gauge changes since passage of the law.

- Second, the program may find a control site outside the State. The Honolulu Department of Public Health, for example, compared its own mortality rates from swimming pool drownings before and after passage of a pool fencing law to those of Brisbane, Australia, a city similar in climate, population, and pool/house ratios, but without a pool fencing requirement. Finding a control site with adequate comparative data can be, however, a difficult task.

Direct measure studies, such as a case-control exposure study, provide more detailed information on program impact. The case-control study has two objectives:

- To determine whether children exposed to an intervention are less likely to be injured than children not exposed to the intervention; to determine whether children of parents exposed to an intervention are less likely to be injured than children whose parents are not exposed

- To assess the extent to which the interventions permeated the target communities

The Massachusetts project undertook a case-control study in two target communities. The study focused on three groups of parents of children up to five years old:

- **Injured Study Group**—Children hospitalized or treated for a target injury in the emergency department (five sample hospitals, n = 200).

- **Hospital Control Group (Uninjured)**—Children hospitalized or treated in the emergency department for an acute illness (five sample hospitals, n = 100).

- **Neighborhood Control Group (Uninjured)**—Target community children who did not experience target injuries during the two months prior to the study (n = 100).

After assuring confidentiality and securing hospital approval, project staff identified injured study group cases and hospital control cases from ED logs; they selected neighborhood control cases randomly from city census data. Hospitals sent letters to parents of identified cases describing the study and soliciting participation. Parents who agreed to participate were interviewed by telephone about injury history, preventive behavior, exposure to program interventions, and basic demographics.

3. EVALUATION ANALYSIS

The final step is to develop an analysis plan explaining how input, process, and impact data will be used. The plan will reflect the evaluation design, measures, and data sources and collection procedures. For a design with "before and after" readings in test and control groups, tables can be produced to examine program impact on mortality, injury incidence, ED visits, hospital admissions, total hospital days, and knowledge and behavior. Separate tables can be constructed for all injuries and for each target injury. Table 18 and 19 illustrate incidence and knowledge outcomes.

Change in outcome between target and control groups and over time can be compared using t-tests, ANOVA, non-parametric, and other statistical tests. The choice of statistic will depend on the nature of the data being analyzed. Sampling error should be taken into account when making inferences. The extent to which input and process can be related to change in outcome depends on how well explanatory measures are quantified. For measures that can be quantified, analysis of covariance can examine the influence of multiple factors on outcome. Statistical interpretation of causal relationships may be limited because much data is qualitative. Seek assistance from statisticians in determining appropriate analytic techniques.

Be aware of and plan for potential difficulties in analyzing and interpreting data. Thoroughly explore potential difficulties, and design the evaluation to minimize them. Examples include:

- A small sample size, a short time horizon, and resulting low numbers of injured children limits the applicability of many statistical techniques; make sure the sample size is big enough and the implementation period long enough to permit significant differences to emerge.

- Extraneous events (e.g., a house fire, promotion of a national prevention campaign) can influence the same measures the program is hoping to influence. Keep abreast of related happenings in the target and control communities.

- Test bias may occur when the household survey is administered to the same group pre- and post-intervention. Because respondents learn from surveys, replace part of the pre-intervention sample with new interviewees during the post-test.

- It is difficult to separate the effects of multiple interventions on a single community. For instance, if parents are buying more ipecac, it may be because physicians suggested it during an anticipatory guidance session, because pharmacists recommended it, or because the childbirth educator mentioned it. A household survey can help uncover reasons for particular changes.

TABLE 18

INCIDENCE RATES OF BURN INJURIES BY TYPE OF INTERVENTION AND TIME PERIOD

TYPE OF INTERVENTION	TIME PERIOD							
	FOUR YEARS PRECEDING PROGRAM		FOUR EIGHT-MONTH (OCTOBER TO MAY) PERIODS PRECEDING PROGRAM		EIGHT-MONTH PERIOD OF PROGRAM IMPLEMENTATION (OCTOBER TO MAY)		TWELVE-MONTH PERIOD AFTER PROGRAM (JUNE TO MAY)	
	RATE*	(NUMBER OF BURNS)	RATE*	(NUMBER OF BURNS)	RATE*	(NUMBER OF BURNS)	RATE*	(NUMBER OF BURNS)
School-Initiated (Lynn)	38.7	(1,222)	35.2	(740)	35.8	(176)	41.1	(297)
Community-Initiated (Quincy)	18.0	(658)	16.6	(405)	13.7	(84)	16.9	(156)
Media Campaign (Salem and Saugus)	26.3	(668)	22.0	(373)	25.5	(106)	27.0	(168)
No Intervention (Holyoke and South Hadley)	22.2	(562)	21.2	(358)	20.3	(84)	21.7	(134)

* Burns per 10,000 person-years of observation.

Source: McKay, A.M., and Rothman, K.J. The incidence and severity of burn injuries following Project Burn Prevention. American Journal of Public Health, 72(3):248-252, 1982.

TABLE 19

KNOWLEDGE OUTCOME
CALIFORNIA DEMONSTRATION PROJECT

PERCENT WHO COULD GIVE POISON CENTER TELEPHONE NUMBER			
CITY	PRE-INTERVENTION	POST-INTERVENTION	DIFFERENCE POST-PRE INTERVENTION
Escondido (Test)	30.2%	63.7%	+33.5*
Chula Vista (Control)	40.8%	49.2%	+ 8.4**

* $P < .001$

** $P = .017$

*** $P < .001$ for difference in Post-Pre for Escondido versus Chula Vista

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